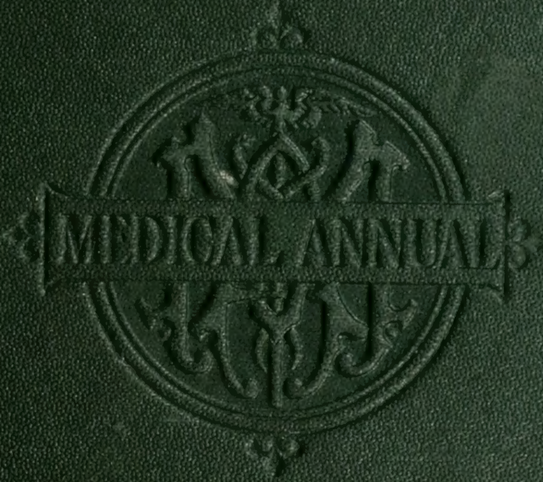

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Surgical Instrument Makers, LIVERPOOL.

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At the suggestion of Capt. H. T. Wilson, R.A.M.C., we have made a Case to hold an extra Tray, and added the following articles: Hypodermic Syringe, Clinical Thermometer, and four tubes of Tablets, viz., Eucaine and Suprarenalin, Strychnine, Morphine, and Ergotin, etc.

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"Excellent. Its dietetic and digestive value is beyond dispute."—*Lancet.*

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The "BRITISH MEDICAL JOURNAL" states :

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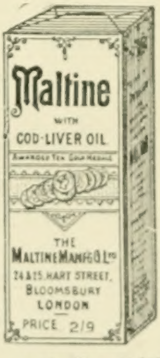

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Easy Digestibility.

High Food Value (due to the Cod Liver Oil being rendered entirely available by the organism as well as to the nutritive re-enforcement supplied by the reconstructive constituents of the "Maltine."

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A most useful and ornamental piece of furniture for Surgery or Consulting Room.

**PRICE,
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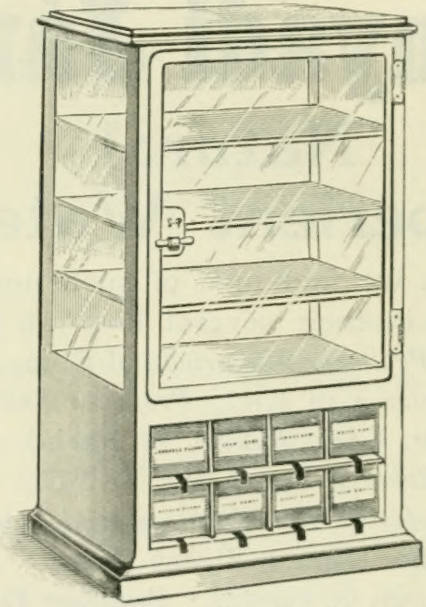

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The Dressings usually supplied are Boric Wool, Cyanide Gauze, Alembroth Wool, Bandages, Muslinette (Waterproof Material) Absorbent Gauze, Absorbent Lint, and Adhesive Plaster on reels, but of course these can be varied as desired.

When Dressings are exhausted, they can be replaced, if wished, in new cardboard boxes at a trivial cost.

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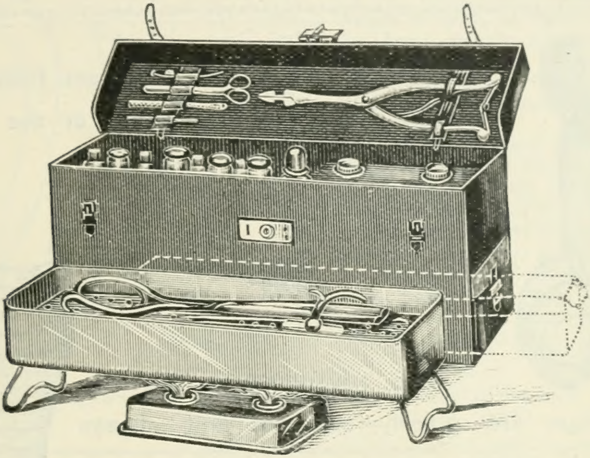
MIDWIFERY BAG WITH STERILIZER.



The bag is made of cowhide (either black or brown) and has a compartment beneath into which the Sterilizer fits.

The Sterilizer has no seams, being blocked out in one piece from a solid metal sheet and heavily nickel plated.

The larger instruments are carried in Sterilizer, the top portion of the bag being reserved for Nail Brush, Lamp, Chloroform Bottle, Pill and Medicine Bottles, Dredger, leaving room for Apron, Gloves, &c.

The inside Cover has loops arranged for carrying the smaller instruments.

PRICE of the Bag, together with Sterilizer, Lamp, Nail Brush in plated case, Minim measure in case, Chloroform Bottle in plated case, Dredger, 3 Pill Bottles, 3 Medicine Bottles.

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An outside Canvas Cover can be supplied at 7/6 extra.

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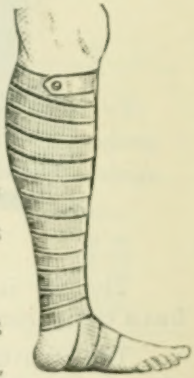

The advantage is that the bandages are quickly adjusted, and always keep in position.

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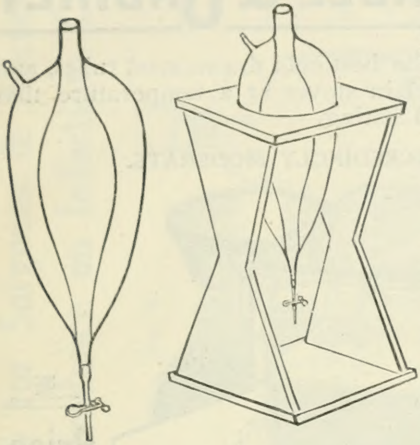

The difficulty of keeping a solution at an even temperature during administration, led Mr. Arthur J. Evans, F.R.C.S. Edin., Hon. Surg. Liverpool Stanley Hospital, to design a flask on the Dewar principle, which has proved very successful.

The inner portion has a capacity of 500 c.c. and is separated from the outer by a vacuum.

Warm fluid allowed to stand in the flask loses only 3°F in half-an-hour, so that in the ordinary time taken for administration, only 1°F is lost.

The apparatus is well adapted for any purpose in which it is necessary to introduce warm fluids into the body, via the veins, tissues, or rectum, without the cumbrous method of keeping the solution warm by means of spirit lamps, water baths, etc.

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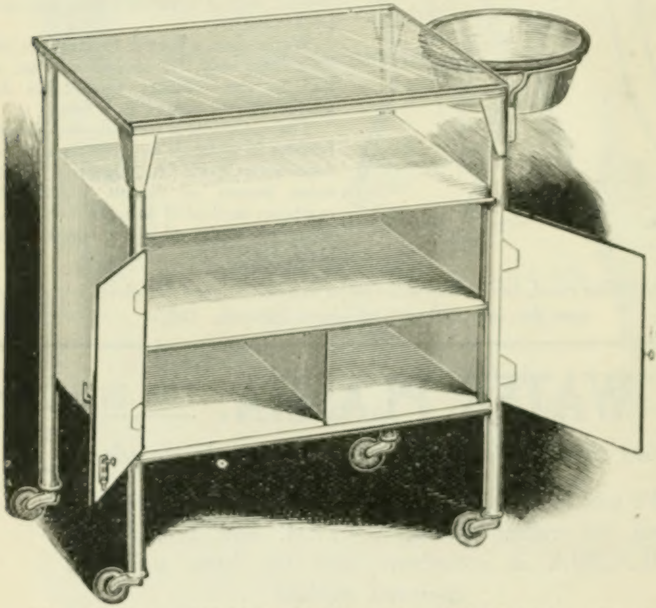

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Fig. 1.

Fig. 1.

APRONS, as suggested and worn by Mr. Thelwall Thomas, of Liverpool.

Price **9**/- each.

In White Drill, 5/- each.

Measurements required—

Circumference at chest, and length desired.

⁂

Fig. 2.

Fig. 2.

COAT, with three pockets.

Price **18**/- each.

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Circumference at chest, length of sleeve and length of coat desired.

⁂

Fig. 3.

Fig. 3.

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Price **15**/- each.

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Circumference round neck and chest, length of sleeve and length of overall desired.

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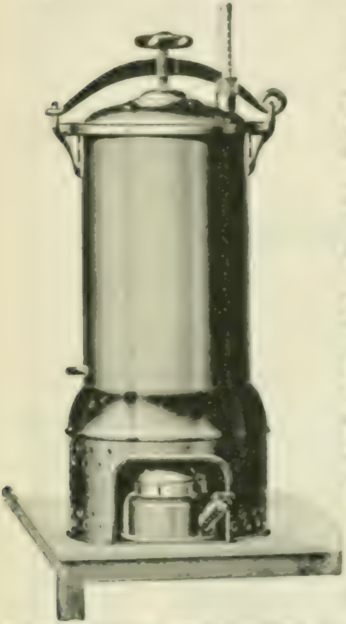

Fig. I. [illegible]

THIS Apparatus, [illegible]

[illegible]

[illegible] sterilization is complete.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] C [illegible]

Full
Directions for Use
sent with
each Apparatus.

Fig. II. [illegible]

Fig. III.

A [illegible]
C [illegible]
D [illegible] C.
H [illegible]
K [illegible]
T [illegible]
W [illegible]

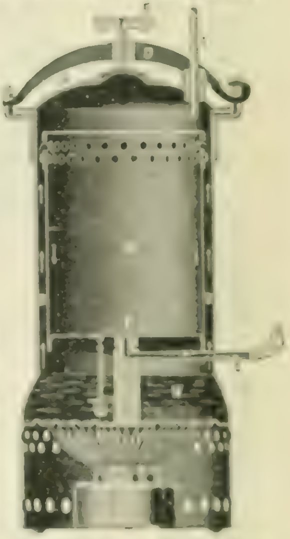

Fig. III. [illegible]

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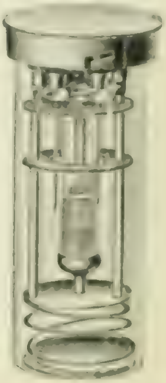

The Syringe [illegible] is suspended together with [illegible] needles in a glass tank [illegible] inches. The tank has a bayonet-jointed metal cap, lined with a special washer which makes it quite water or spirit-tight. The Syringe and Needles can therefore be kept ready sterilized by suspending them either in Alcohol or a solution of Cresol, thus saving the operator the necessity of boiling the instrument each time it is used.

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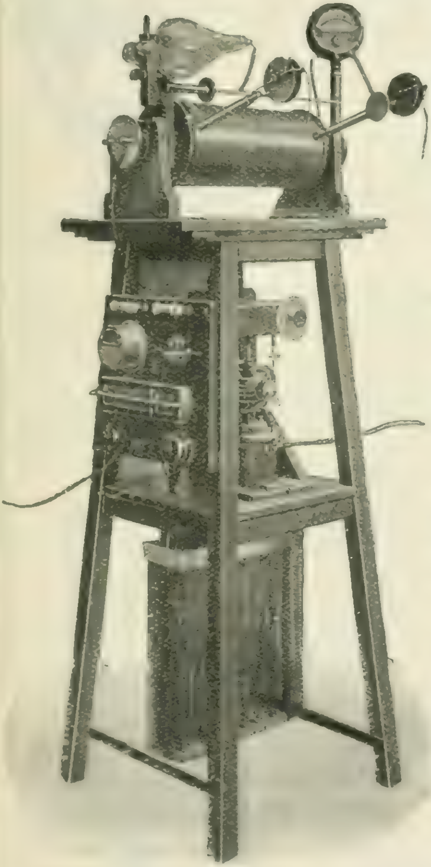

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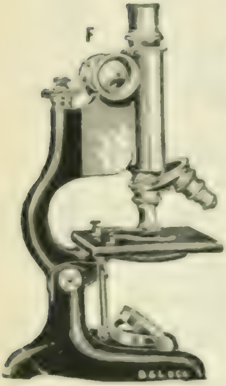

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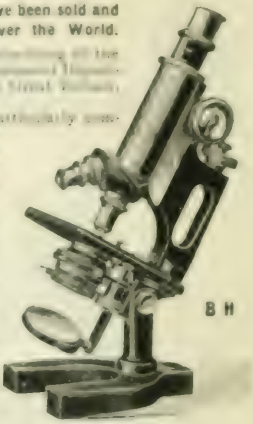

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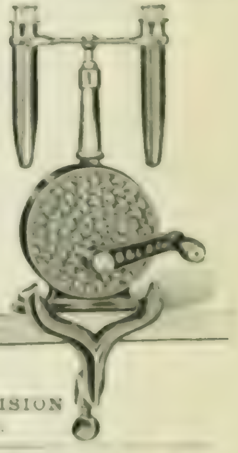

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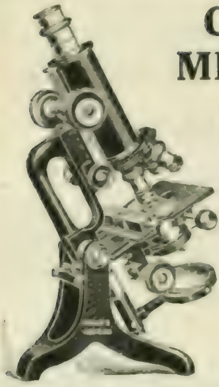

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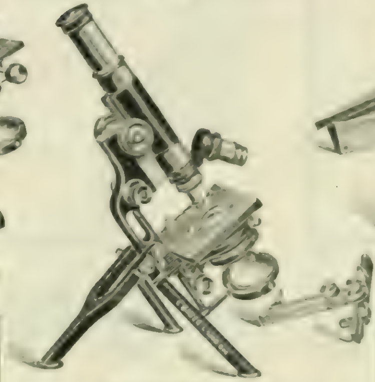

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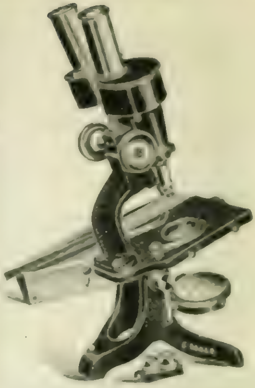

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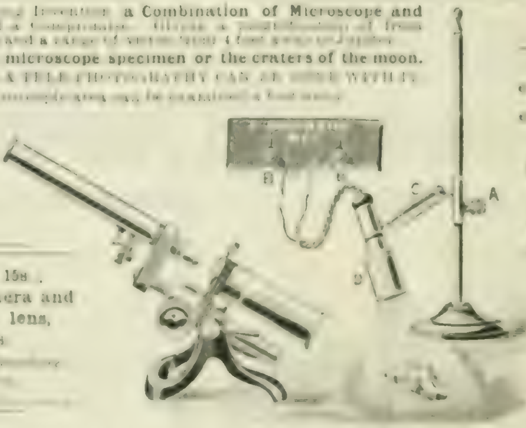

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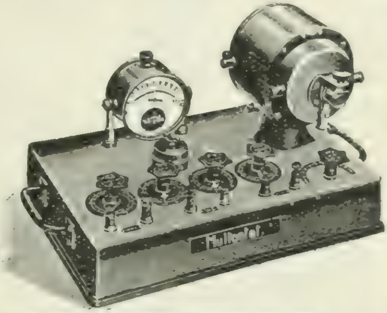

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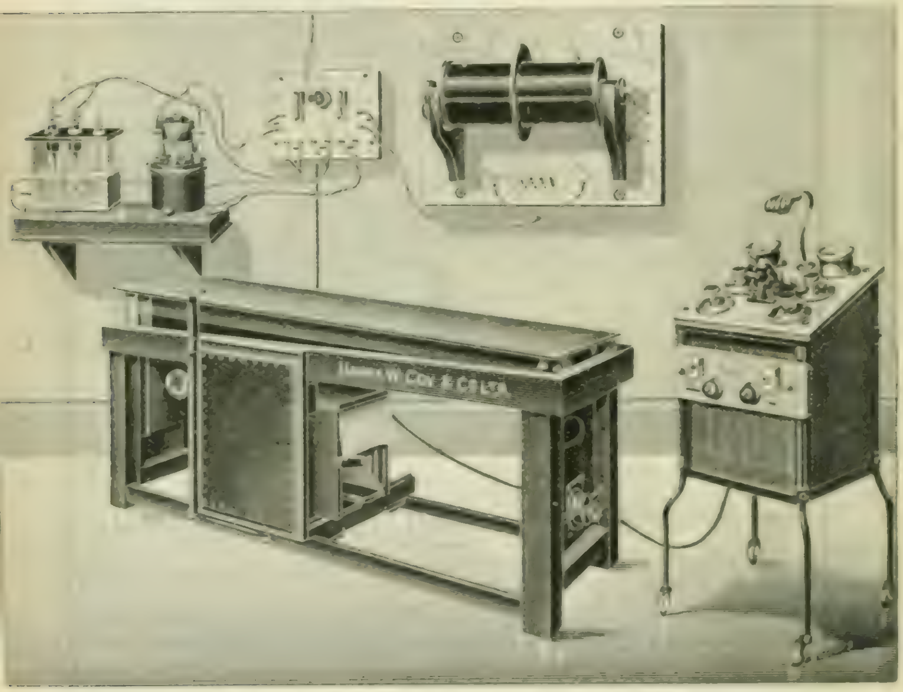
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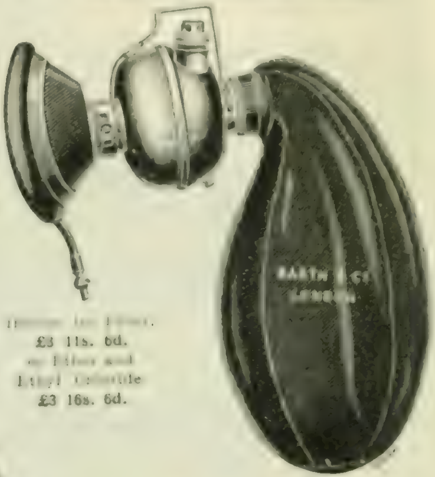

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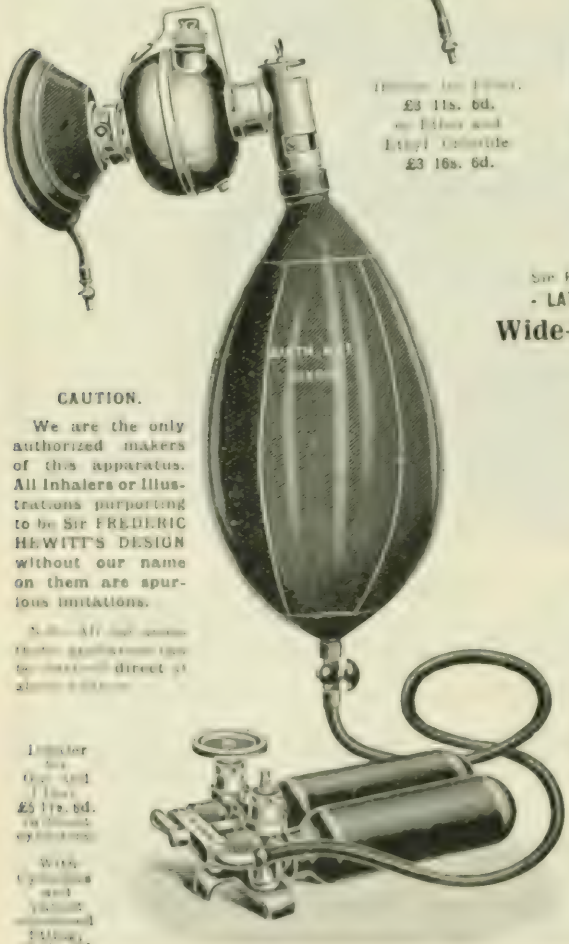

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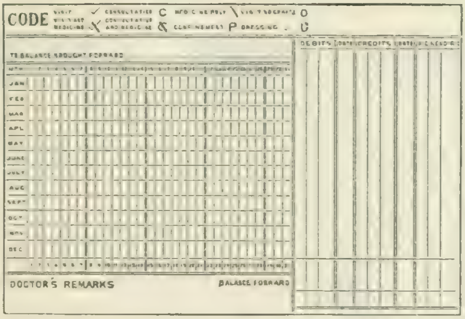

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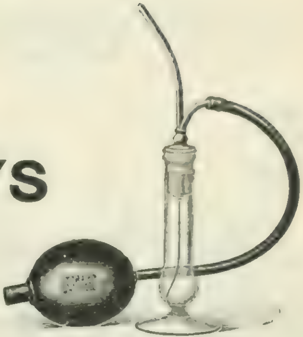

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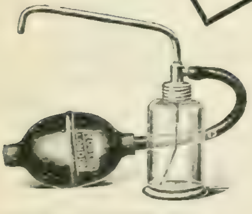

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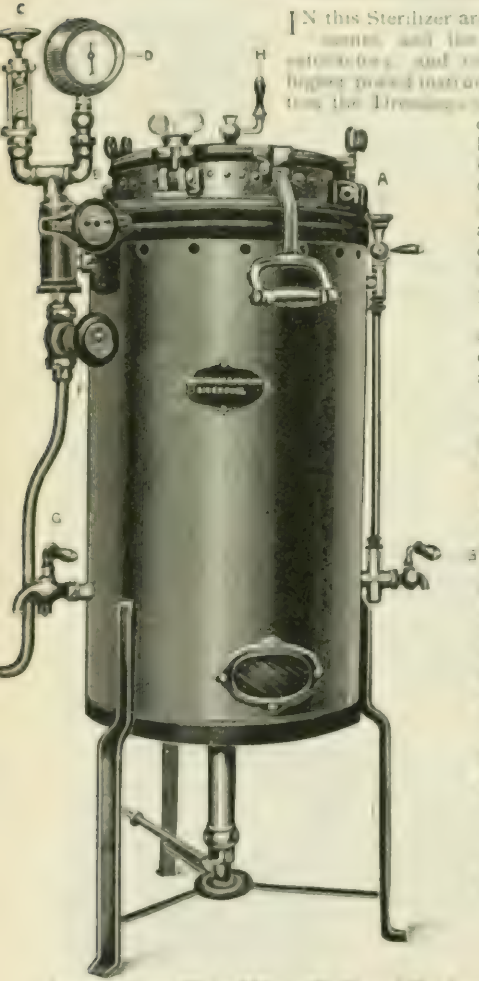
HIGH PRESSURE STEAM DRESSING STERILIZER



IN this Sterilizer are embodied all the latest improvements, and the results obtained are absolutely satisfactory, and constitute an advance on those of higher priced instruments. On completion of Sterilization the Dressings will be found perfectly dry. It is equipped with Ejector with Combined Vacuum and Inlet Valve, Combined Pressure and Vacuum Gauge and Safety Valve. The Ejector gives a Vacuum of 8 in., a result hitherto seldom, if ever, obtained in a sterilizer working, as this does, at a pressure of 15 lb. per square inch.

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Built and equipped for Gas or Steam, complete with two Nickel-plated Drums **£28**

New Pattern Horizontal Type, with all the latest improvements, giving 10 in. vacuum and 15 lb. pressure. Inner Chamber measures 22 by 15 in. Built and Equipped for Gas or Steam . . **£58**

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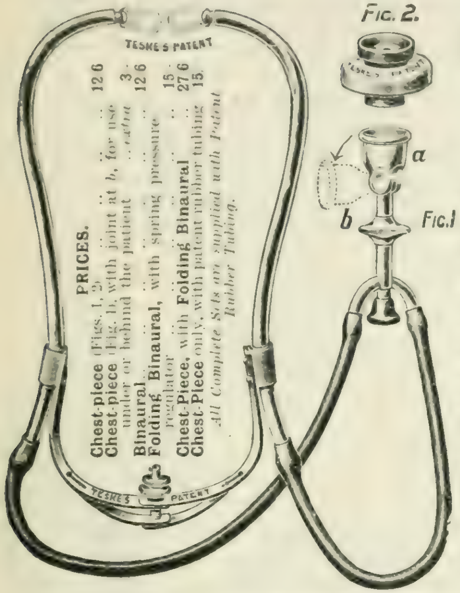

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Chest-piece (Figs. 1, 2)	12/6
Chest-piece (Fig. 1), with joint at *b*, for use under or behind the patient ... *extra*	3/-
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THE SET consists of a CHEST-PIECE and a BINAURAL ATTACHMENT.

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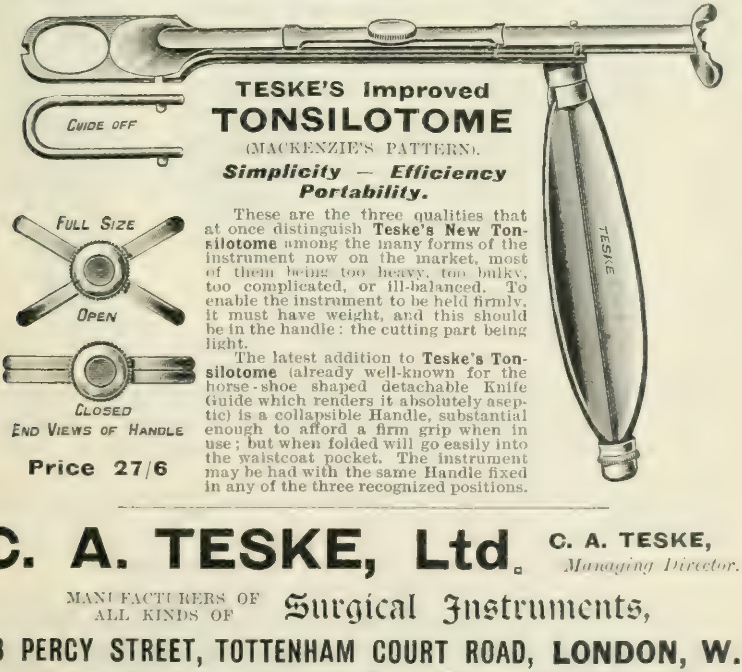
The **Standard BINAURAL** is the only one having a perfect means of adjustment, enabling it to be worn with comfort by any user. By simply turning the larger of the two circular nuts shown at *c*, the strength of the spring can be increased or diminished: the smaller nut will fix the larger one permanently. The ear-tips themselves having a universal joint can be fixed at any angle required.

The Chest-piece (*Fig.* 1), can be supplied with a joint at *b*.

Full Description and Instructions for Use promptly forwarded on application.



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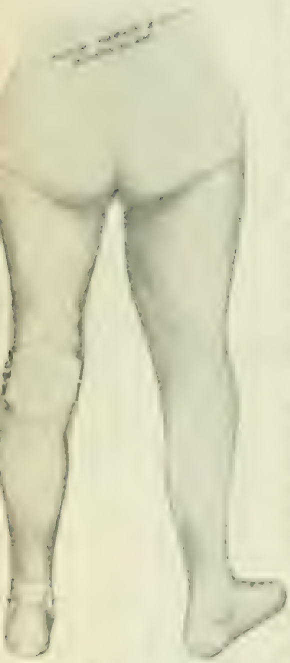

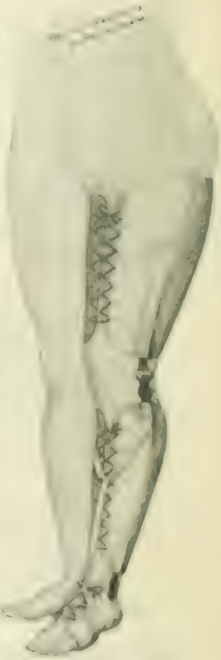

It can be used for all purposes for which an artificial support is required, from the simple fracture of the fore arm or leg to the complicated spinal support or artificial limb ; in fact, there is no practical limit to the uses of PEXULOID Appliances in Surgery. They can be jointed, hinged, or laced. They can be made in any number of parts ; they are quickly applied and as readily removed. Windows for Ventilation can be arranged, and they cost far less than the usual steel appliances.

PEXULOID entirely supersedes all other splint material, being clean, durable, and comfortable. It is perfectly adaptable to the shape of the part, does not irritate, and is far superior to any substance previously introduced.

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"AUTO" BANDAGE WINDER.

Patent No. 14208 12.

The "Auto" Patent Bandage Winder is the result of long experiment, and is offered as a perfect solution of a great problem.

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The "Auto" Bandage Winder is constructed entirely of metal, nickel-plated, containing a powerful spring, which when set (by turning the handle a few times) has sufficient motive power to completely wind the longest 4-inch down to 1-inch bandage of calico, open-wove, or any other material. An effective brake is introduced into the mechanism, which allows the operator to control the spring at any point.

The operator has both hands free (as shown in the illustration) to untangle the twisted bandage.

We thoroughly recommend the use of the "Auto" Bandage Winder for—

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The Harris "Auto" Bandage Winder (Patent No. 14208/12), Nickel Plated, and strong clamp for fixing on to any shelf or table ... **22/6**

— *Special Prices for Quantities.* —

INSTRUCTIONS.

Screw the Winder, by means of clamp, to any suitable shelf or table, push down the brake knob, then turn handle a few times—affix end of bandage to sleeve pin, hold bandage tightly, release break, and the bandage will automatically pull through your hands and self wind. On pulling off the bandage, it will be found to be perfectly wound.

— *May be sent on approval.* —

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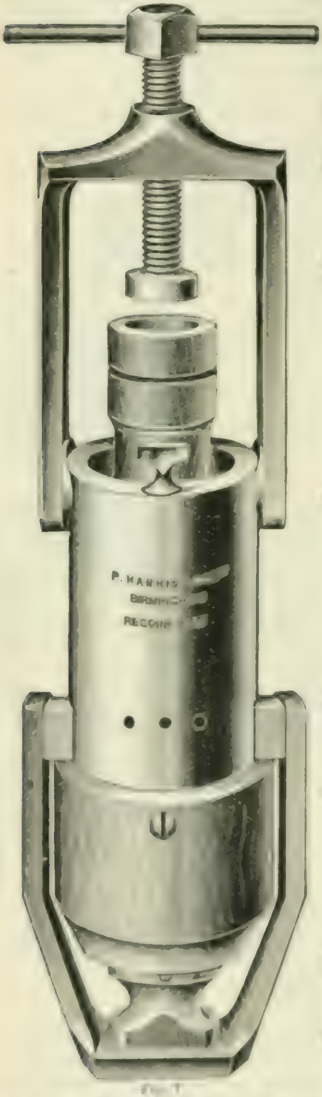

Fig. 7.

The "Hall Edwards" Carbon Dioxide Snow Collector and Compressor

Apparatus for Collecting and Applying Carbon Dioxide Snow.

SEE THE LITTLE MANUAL.

CARBON DIOXIDE SNOW: Its Therapeutic Uses. [illegible] 3s. 6d. [illegible]

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The snow is always of the same hardness and the test of complete and proper compression is that the cone should sink in water.

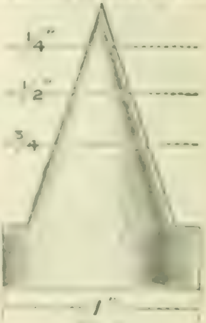

Fig. 9.

Fig. 9. Diagram of Compressed Snow, [illegible] a circle of any desired diameter.

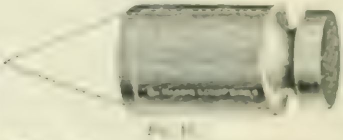

Fig. 10.

Fig. 10. [illegible]

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Hal Edwards' Improved Set for producing CO_2 Hard Snow, [illegible] small pencils [illegible] £2 7 6

SET No. II.

[illegible] 4lb. Cylinder [illegible] £4 6 6

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CONTENTS: -

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1 Sharp Hook | 1 Silver Probe | 1 Director with Scoop
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1 Bottle of Silk in Alcohol, with metal screw cap
1 Double Sharp Volkmann's Spoon
1 Record Hypodermic Syringe with 2 Needles.

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(*b*) The instruments, once sterilized, are always ready for operation and in perfect sterile condition.
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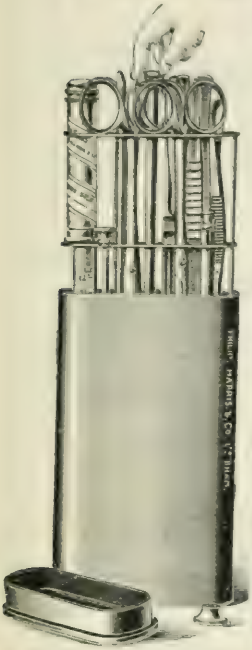
Indispensable for Country Work and Field Purposes.

PRICE, complete 42/-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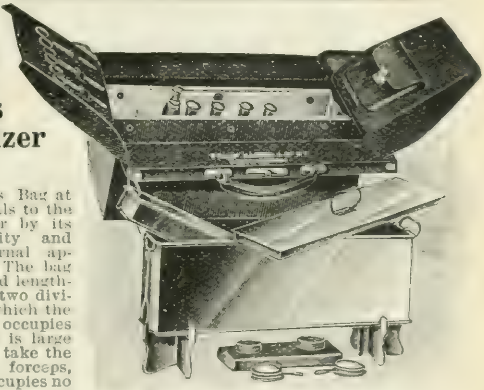
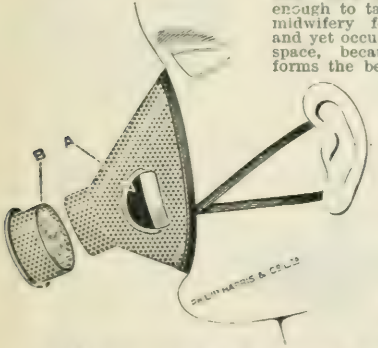


Harris Sterilizer Bags.

The Harris Bag at once appeals to the practitioner by its practicability and nice external appearance. The bag is separated lengthways into two divisions, of which the sterilizer occupies one. This is large enough to take the midwifery forceps, and yet occupies no space, because it forms the best possible container for the aseptic dressings and instruments which the surgeon requires to carry. The sterilizer is made of copper, and has a perforated tray, lid, and a wickless two-rose lamp. The other division is furnished with a washable take-out lining, and loops for bottles, etc. The whole is covered with brown or black cowhide, and has excellent fittings. Nothing better for all general purposes.

Size closed, 16 by 8 by 5½ ins., complete with Sterilizer .. 63/-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The "HARRIS-YEO" IMPROVED INHALER.
(Regd. Design No. 611594 12).

For Treatment of Tuberculosis:

Dr. Burney Yeo's Inhaler, which is universally used, is found not to admit enough air. This is especially evident when used in those cases where rapid respirations, cough, dyspnœa, and the accompanying cardiac embarrassments, are prominent features. These symptoms were usually much increased by the obstruction which was offered to the respirations by the closed inhaler. The illustration shows "A" cut away and acts as a ventilator, which not only brings about better results, but is much more comfortable to use. The lid "B" takes off to enable the patient to remove once or twice daily to be cleaned, thus cap "B" also prevents the inhalant trickling down the side on the patient's face.

"Harris-Yeo" Improved Inhalers (Regd. No. 611594 12) .. Per dozen 12/- net.

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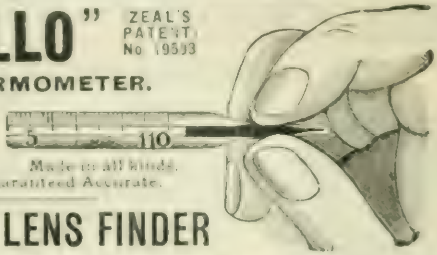
ZEAL'S PATENT. No. 19593



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A 30 sec. reset instantly. Made in all kinds.
Kew Certificated. Guaranteed Accurate.

NEW IMPROVED LENS FINDER

The only Easy Reading Magnifying Clinical Thermometer on the Market.

The square mark engraved on lens front locates the Mercury immediately.

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"Neboline" Compound No. 21 (Atropine ¼, Cocaine Hydrochloride gr. 2 in each oz.) conveyed in a unique degree of atomisation by means of the "Aeriser" or "Universal Vaporiser," quickly averts the paroxysms of Asthma. This preparation, which has a very extensive sale in the United States, was the subject of comment in a notable case before the High Court.

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A Policy which Protects the Medical Profession and discourages Self-medication.

PRICES:— [illegible]

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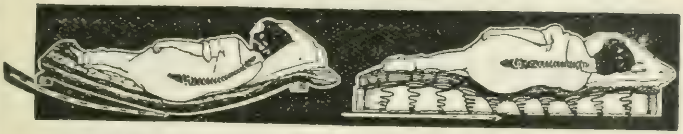
SLEEP STRAIGHT

STAPLES

MATTRESS
"CANNOT SAG"



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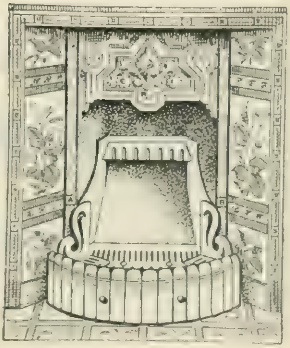

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— [illegible]	- 9
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Liq. [illegible] Meth.	[illegible] 1 2
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Liq. [illegible] B.P.	[illegible] - 11
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— [illegible]	[illegible] 1 -

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— [illegible]	6 lb. 1 1

	[illegible]
[illegible] B.P.	[illegible] 5 6
— [illegible]	
[illegible]	[illegible] 1 9
— [illegible]	[illegible] 4 [illegible]
— [illegible]	[illegible]
— [illegible]	[illegible] 2 [illegible]
— [illegible]	[illegible] 1 11

	B.P.	[illegible]
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	B.P.	Aquos.
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— [illegible]	[illegible] 6	
— [illegible]	2 6	1 -

PILLS, TASTELESS COATED

	[illegible]
[illegible]	[illegible] 1 9
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	[illegible]
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— [illegible]	[illegible] 9
[illegible]	[illegible] 1 8

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(For [illegible] see *The Lancet* [illegible], page [illegible]) **Reg. Trade Mark**

has marked advantages over any other agents employed in the treatment of Tuberculosis. It is not a drastic remedy and hence it will never cause any harm locally or constitutionally. Some thousands of cases have been treated with it during the last 3 years and the results enable us to form the following conclusions : **it is practically infallible in early cases, it is capable to arrest the disease in advanced cases, and it is palliative in extreme cases.** It is strongly indicated in Pulmonary, Joint and Glandular Tuberculosis.

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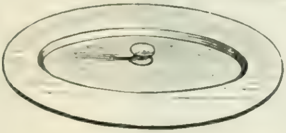

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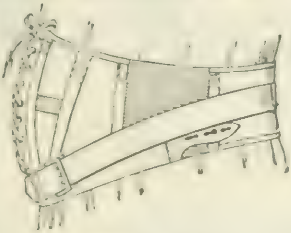

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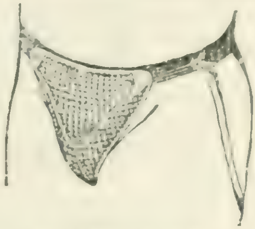

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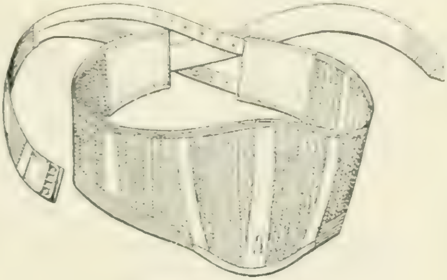

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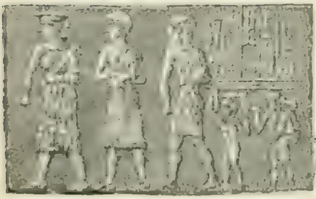

A cylinder seal belonging to the scribe of an early Akkadian prince.

The decorations show the cylindrical character of the seal and a conventional representation of the semitic plaid as engraved upon the seal. Circa 2700 B.C.

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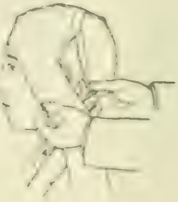

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Stele of a King of Akkad, circa 2600 B.C., found at Pir Hussein. The King is represented as dressed in a long narrow shawl wrapped round the body in parallel bands. The end of this Akkadian garment was thrown over the left shoulder. It had no opening in front like the later Sumerian mantle.

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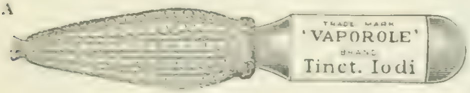

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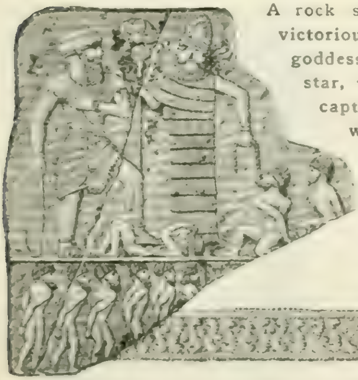

A rock sculpture, circa 2800 B.C., representing a victorious Semitic king. Before him stands the goddess Ishtar, holding in one hand the divine star, while, with the other, she leads a bound captive with a rope through his nose, behind whom kneels a second prisoner. The king tramples a third prisoner underfoot. Other captives, headed by their king, are seen in the lower tier. The victorious king is clad in the Semitic plaid, supported by an embroidered girdle which is here extended to form a border design.

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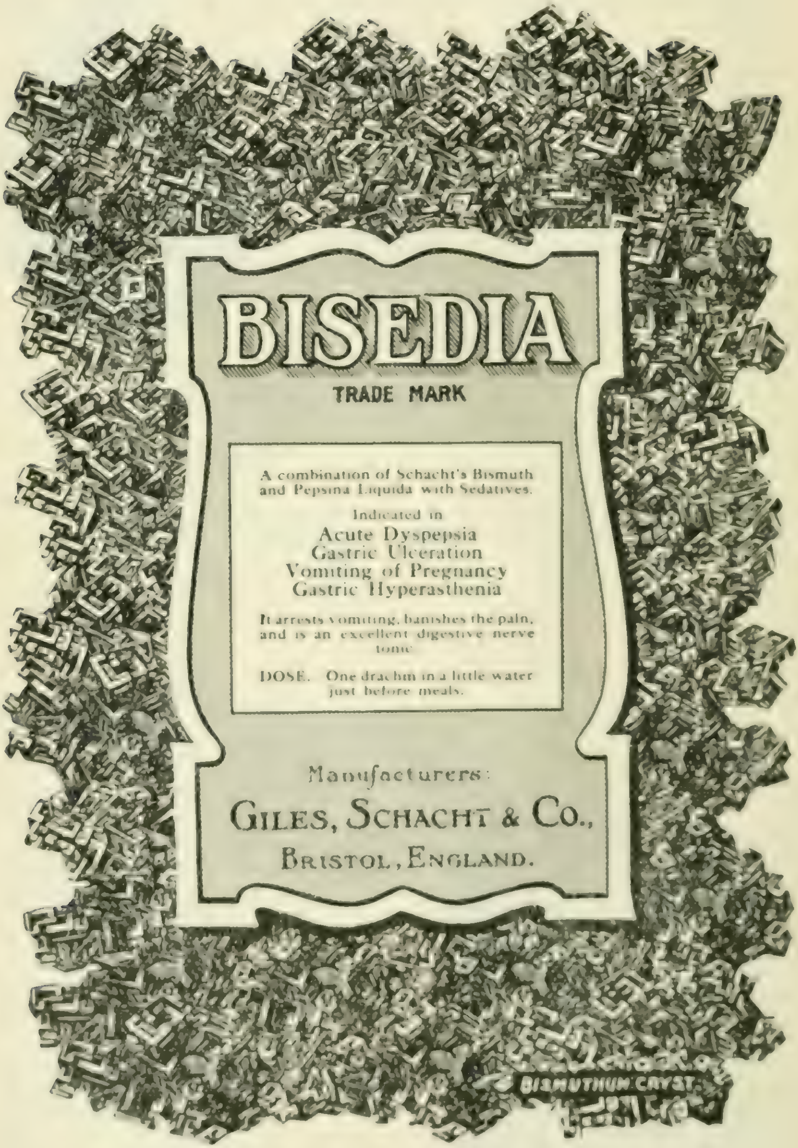
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CONTENTS.

	Page
Contributors and Sections	lxxvii
Preface	lxxxiii
General Index	lxxxvii
Glossary	cxxxv
Review of Therapeutic Progress, 1913	1
Dictionary of Remedies	1–37
Radio-activity and Electrotherapeutics	38
Tuberculin Therapy	68
Review of Medical and Surgical Progress, 1913	77
Dictionary of Treatment	84
Anæsthetics	102
Blood Examination	147
Brain Surgery	155
Bronchoscopy	166
Cancer	175
Fractures	242
Surgery of the Lung	344
Malingering	353
Pellagra	416
Artificial Pneumothorax	445
Lateral Spinal Curvature	528
Suggestion in Therapeutics	558
Syphilis	568
Tuberculosis	622
Public Health	670
Medico-legal and Forensic Medicine	670
State Medicine	673
Legal Decisions affecting Medical Men, etc.	677
Industrial Diseases and Toxicology	685
Editor's Table—New Inventions and Preparations	688
Books of the Year	733
Establishments for the Treatment of Mental Diseases	752
Sanatoria for Tuberculosis	761
Institutions for Inebriates	765
Hydropathic Establishments	767
Nursing Institutions and Homes	768
Spas, Principal British	770
Official Directory	776
Educational Vaccination Stations	778
Medical and Scientific Societies, and Periodicals	779
Directory, Medical Trades	[illegible]
Private Notes and Addresses	[illegible]
Life Assurance Offices, List of	[illegible]

Index to Advertisers . cxxvi

F

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Every article is carefully studied with a view to rendering it as concise as possible, because we recognize that in this form it is most useful to the profession; but we cannot omit matter which any section of our readers may regard as important.

Fortunately, our subscribers steadily increase in numbers: these are not confined to any country, and although some of the diseases described in this volume may never come under the notice of the practitioner in Great Britain, we should be sorry to suppose that he desired no information concerning them. Moreover, it is because we have tried to make the *Annual* entirely cosmopolitan that we are able to obtain the ready help of the leaders of medical thought and research in all parts of the world.

Science has no geographical boundaries, and it is only necessary to glance through the names of contributors to the pages of the *Annual* to realize that nationality has little influence upon medical progress. We represent a universal fraternity having objects and methods in common, and whose results are of equal interest to all.

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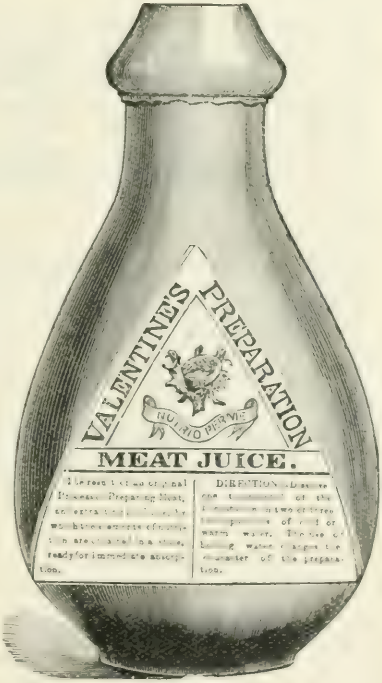

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General Index:

The more important articles are in heavy type.

PAGE
ABDERHALDEN'S test in diagnosis of pregnancy 150, 453
Abdomen, gunshot wounds of 84
Abdominal aorta, aneurysm of 112
— muscles, relation to spinal deformity 530
— operations, new clamp for 603
— retractor, new designs 713
— surgical, general review of 77
Abdominal wall, ligneous phlegmon of 85
Abduction in operation for fracture 244, 248
Abel's bacillus in ozæna 384
Abortifacients, small value of volatile oils as 9
Abortion, relation of sale of diachylon to 685
— erystypticin in treatment of .. 9
— indications for in pregnancy toxæmia 456, 457
Abscess of bone, *x*-ray diagnosis of .. 43
— the brain 155
— — due to amœbæ 91
— cold, action of carbenzyme on .. 6
— cerebellar, differentiation from labyrinthitis 325
— cervical.. 404
— intramural, treated by hysterectomy 661
— of lesser sac following pancreatitis .. 472
— liver, amœbic, emetine in 93
— — in India 91
— lung 347
Abscesses, vaccine treatment of.. .. 36
Acanthosis nigricans 85
Accidents, diseases classed as 671
Accommodation, errors of 483
Aceto-salicylic acid in rheumatoid arthritis 125
Acetone in urine, test for 656
Acetyl-aceto-salicyl-trichlor-isobutyl-ester in gout 271
Achylia gastrica, analysis of duodenal contents in.. 412
— — in children.. 215
— pancreatic character of fæces in 216
Acid intoxication, salicylates in causation of 401
— sodium phosphate, action on urine of 32
— — — in enuresis 229
— — — urinary infections 654
Acid, sulph. dil. in furunculosis.. .. 254
Acidosis in pregnancy 455
— and the question of operation .. 205
Acitrin as uric acid eliminant .. 1, 724
Acne, ichthyol in 511
— ionic medication in 59
— resorcin in 507
— rosacea, new method of applying sulphur 31
— — sulphur in 510
— sub-aural, precocious *x*-ray reactions after treatment 49
— thymus extract in 515
Acne vulgaris 86

PAGE
Acne vulgaris, vaccine therapy in 36, 512
Aconite, belladonna, and chloroform in fibrositis 239
— effect on pulse-rate 1
— in gonorrhœa 267
Aconitine, rapid deterioration of .. 2
Acromegaly, relation of dyspituitarism to 435, 437
Actinomycosis 86
— vaccine treatment of 87
Adalin as sedative 724
Adamon, a bromide-valerian sedative.. 724
Addison's disease 88
— — a contraindication for salvarsan.. 574
Addresses of nurses, etc. .. 793, 794
Adenitis, chronic, *x*-ray treatment of .. 48
— after removal of adenoids 88
Adenoids 88
— colloidal silver in 30
— in etiology of otitis media 401
— — rheumatism in childhood .. 402
— removal of, in cure of enuresis .. 228
— *x*-ray treatment of 49
Adenomatous enlargement of prostate.. 458
Adhesions, peritoneal, methods of promoting 432
Adigan, a new digitalis preparation .. 8
Adiposity, effect of pineal and pituitary glands on 435, 437
— leptynol for 15
Adolescent albuminurics and life insurance.. 88
Adrenal extract (*see* Suprarenal)
Adrenalin in anæsthesia for spinal surgery 524
— asthma of children 130
— cholera 193
— enuresis, of little value 229
— hæmorrhages of the newly-born .. 273
— injection, danger with light chloroform anæsthesia 106
— in nephritis 2
— non-corrosive poisoning cases .. 2
— pernicious vomiting 456
— and pituitrin, good results of combining 24
— in urticaria 659
— whooping-cough 433
Adrenalinæmia theory of hypertension.. 374
— *x*-rays in 154
Adrenalin-cocaine direct injections in asthma and bronchitis 224
Adulteration of food, legal decisions re 677
Aerophagy in angina pectoris, treatment 114
After-care in rheumatic carditis .. 282
Agar jelly bougies in gonorrhœa .. 270
Agchylostoma ceylanicum, description of 649
Age, importance of, in treating spinal curvature 529
— incidence in pellagra.. .. 417, 425
— — tuberculosis in childhood.. .. 624
Agglutination tests in typhoid fever .. 641
Agmel for renal and urinary inflammation 725

PAGE
[illegible]
[illegible] bismuth powder [illegible]
Air-passages, relation to rheumatism in childhood [illegible]
Air, hot, and massage in gonorrhœal arthritis 269
— — — rheumatoid arthritis [illegible]
Albumin content of cerebrospinal fluid .. 189
— — pancreatic fluids [illegible]
— and pus in urine, relation between .. 658
— reaction in sputum 547
— in rectal feeding [illegible]
Albuminuria 88
— [illegible]
— cataract associated with [illegible]
— cyclic, with intestinal dyspepsia of children [illegible]
— with diseased tonsils [illegible]
— in pregnancy 455
Alcohol in arteriosclerosis 121
— etiology of gastric cancer 549
— — glycosuria 203
— — [illegible] paralysis [illegible]
— injections in laryngeal tuberculosis .. 331
— — trigeminal neuralgia 377
— in intestinal dyspepsia of children .. 216
Alcoholism, suggestion treatment of .. 565
Aleucocythæmic leukæmia 336
Aleudrin as a sedative and hypnotic [illegible]
Alkalies in intestinal dyspepsia of children 216
Alkaline baths in psoriasis 464
— expectorants for stout bronchitics .. 166
Alkalinity of blood serum in cancer patients 176
Allantoin dressing after mastoid operation 403
Allyl sulphide in tuberculous joints, etc. 3
Aloes in intestinal dyspepsia of children [illegible]
Alopecia areata [illegible]
— ionic medication in 59
[illegible]
Aluminium acetate in eczema 220
[illegible]
[illegible]
— [illegible]
[illegible]
[illegible]
— [illegible] epithelialization in grafts dressed with 518
[illegible]
[illegible]
Amœbiasis (*see also* Dysentery) .. 90
— [illegible]
[illegible]
Ammonia-nitrogen in urine, tests for .. 657
[illegible]
Amputations [illegible]
— [illegible]
— [illegible]
[illegible]
— [illegible]
[illegible]
Anæmia in children [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
Anæmia, pernicious [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— splenic 544
[illegible]
Anæmic subjects, operations on .. [illegible]
Anæsthesia in bronchoscopy and œsophagoscopy .. [illegible]
— examination of patients before 107
— hysterical, suggestion treatment in [illegible]
— inhalation .. .. [illegible]
— intratracheal 104
— — apparatus for [illegible]
— intravenous [illegible]
— in laryngeal tuberculosis [illegible]
— local, for enucleation of eyeball [illegible]
— — and regional [illegible]
— of mucous membranes, permanganate of potassium producing . 22
— paralysis 107
— by pharyngeal insufflation . [illegible]
— spinal, favourable reports on .. [illegible]
— — in prostatectomy .. . 400
— in spinal surgery [illegible]
[illegible]
Anæsthetics 102
— general review of .. [illegible]
— in [illegible] goitre [illegible]
[illegible]
Anal fissure as cause of enuresis 228
— — etc., ionic medication in 59
Analgesic, aleudrin as an 3
Analgesics, local, with general anæsthetics 103
Analysis of pancreatic ferments .. 411
Anaphylactic reaction in cancer diagnosis 175
Anaphylaxis in tuberculin treatment .. 68
[illegible]
— of nerve roots 527
— saphenous-femoral, for varix .. 665
Anchorion violaceum, a new variety of favus [illegible]
[illegible]
[illegible]
Aneurysm of abdominal aorta [illegible]
— [illegible]
Aneurysm, intrathoracic [illegible]
— — [illegible]
— — etiology 108
— — symptoms and diagnosis .. .. [illegible]
— — treatment 110
— — [illegible]
— [illegible]
— superficial palmar arch [illegible]
— [illegible]
— [illegible]
— Wassermann test in .. [illegible]
Aneurysm, surgery of [illegible]
Angina pectoris [illegible]
[illegible]
[illegible] snow in [illegible]
— [illegible]
[illegible] "blue brain" [illegible]
— [illegible]
[illegible]
[illegible] 620
[illegible] of .. [illegible]
[illegible]
[illegible]
[illegible]
— [illegible]
— [illegible]
[illegible]
[illegible]
[illegible]
Anthelmintic, wermolin as an .. [illegible]
[illegible]
— bacilli in cerebrospinal fluid .. [illegible]
— [illegible]
[illegible]

PAGE
Antimony in sleeping sickness .. 621
Antineuralgic drugs in sciatica 502
Antipertussis vaccine .. .. .. [illegible]
Anti-plague serum, trials with .. . [illegible]
Antipyrin in gonorrhœal arthritis .. 268
— of little value in enuresis .. .. [illegible]
Antiseptic, chlormetacresol as a 6
— new thymol derivatives as 31
— noviform as an 19
— iodine as an 730
Antiseptics, experiments on relative value of 32
— in operation for cataract 183
— urinary 654
Anti-staphylococcic serum, good results 29
Antisyphilitic serum in general paralysis 591, 596
Antithyroidin, disappointing in Graves' disease 264
Antitoxin treatment (*see* Serum)
Antityphoid inoculation 645
Antivenenes in snake-bite 518
Antral suppuration, ionic medication in 59
Anuria, calculous, surgical treatment .. 315
Anus, diseases of 115
Anxiety, aleudrin as sedative in .. 3
Aorta and heart, syphilis of 275
— occlusion of, in aneurysm 113
Aortic insufficiency, Wassermann test in 572
Aphonia, hysterical, suggestion treatment in 565
Apical catarrhs, etc., diagnosis from phthisis 629
— tuberculosis, relation of changes in first rib to 344
Apiol, oil of, small value as emmenagogue 9
Apocynum cannabinum in cholera .. 194
Apoplexy, operation for 158
Apenta water in intestinal dyspepsia of children 216
Appendicitis 115
— Abderhalden's test in 152
— as an accident 671
— complications of 116
Appendicitis, chronic 117
— — rectal palpation in 117
— chylous cysts of mesentery simulating 368
— errors in diagnosis 115
— relation of pericolic membranes to .. 430
— vaccine therapy in fistula following .. 36
Appendix, retrograde, incarceration of 290
Appliances, new medical and surgical .. 689
Argas persicus in etiology of relapsing fever 541
Argyll-Robertson pupil test in cerebrospinal syphilis 587
Argyria, colloidal silver non-productive of 30
Argyrol in Eustachian catarrh 395
Arm, test of malingerers for weakness of 356
Aristol in otitis media 400
Arneth blood count in tuberculosis 148, 623
— — — as guide to tuberculin treatment 75
Arrhythmia, varieties of 279
Arsenic in asthma of children 130
— acanthosis nigricans 85
— anæmia in children 97
— contraindicated in chorea .. .. [illegible]
— in pernicious anæmia 101
— pellagra 418, 427
— psoriasis 464
— tinnitus 613
Arsenical cancer 119
— compounds in syphilis of nose and throat .. .. [illegible]
Arsenite of silver, therapeutic indications 3
Arterial disease, cholesterin in blood in [illegible]
— — of intermittent limp 122
— hypertension (*see* Blood Pressure)
Arterial hypertension in nephritis .. 373
— — [illegible] treatment in .. [illegible]
— hypertension in scarlet fever, suprarenal extract in 501
— pressure in infancy .. .. [illegible]
Arteries, ligation of, in Graves' disease .. 610
Arteries, surgery of 119
Arteriosclerosis 121
— as cause of aural vertigo 666
— and nephritis 374
— association of erythræmia with .. 452
— operation in gangrene due to .. 255
Arterio-venous anastomosis 119
Arthritis, acute, massage in 16
— deformans, identity with rheumatoid arthritis 123
— gonorrhœal, treatment 268
— ionic medication in 59
— pneumococcal, vaccine therapy in .. 36
Arthritis, rheumatoid 123
— — bacteriology of 126
— — premonitory vasomotor signs .. 123
— syphilitic 127
Arthrotomy in gonorrhœal arthritis .. 268
Articular rheumatism 490
Articulation test in cerebrospinal syphilis 587
Ascoli's thermo-precipitin reaction in phthisis 623
Aseptic instruments, new methods of securing 689
Aseptoid mercuric soap 725
Asphyxial conditions, acute, oxygen injections in 21
Aspiration and quinine injection in liver abscess 94
— in subdeltoid bursitis 171
Aspirin in fibrositis 238
— gonorrhœal arthritis 268
— rheumatoid arthritis 125
Astasia-abasia, suggestion treatment in 565
Astigmatic children, frequently becoming myopic 485
Asthma 128
— bronchial, vaccine therapy in .. 105
— effect of nasal operation in 128
— endo-bronchial treatment of .. 224
— treatment 129
Astringent, noviform as an 19
Asymmetry, congenital, malingerers and 357
Ataxia, effect of salvarsan on 582
Atophan in gout 271
— skin rashes produced by 4
Atoxyl in endemic anæmia of children .. 97
— sleeping sickness 621
Atropine in cancer of œsophagus .. 388
— congenital pyloric stenosis 476
— effect on paroxysmal tachycardia .. 285
— in gastric ulcer .. .. .. [illegible]
Attitude, characteristic, in thoracic aneurysm .. .. [illegible]
Auditory nerve, degeneration of 327
— — division in tinnitus 613
Aural diseases (*see* Ear)
— polypus a cause of cough .. .. [illegible]
— suppuration, chronic, treatment of .. 400
— vertigo, causes and treatment . 666
Auricular enlargement as cause of laryngeal paralysis 331
Auricular fibrillation .. . 130
— — action of digitalis in 283
Auricular flutter 131
Auscultation, D'Espine's method, in tuberculous bronchial glands .. [illegible]
— in heart disease 279
Auto-intoxication in causation of uveitis [illegible]
Auto-suggestion, curative use of .. [illegible]
Avulsion of intercostal nerves for visceral crises 526
Azodolen dressing after mastoid operation 403

BALL, Sir C. B., [illegible]; Blundell, J. G., 102; Bonney, V., 102, [illegible]; Boyd, F. D., [illegible]; Brown, [illegible]; [illegible], J. [illegible]
Bacilli in blood-stream in tuberculosis .. [illegible]
— [illegible] capsulatus as cause of gangrene [illegible]
— [illegible] spores in diphtheria . 211
— [illegible] [illegible]
— [illegible] in infantile diarrhœa [illegible]
— — diabetes [illegible]
— coli in causation of pyelitis in children [illegible]
— — [illegible] [illegible]
— — — mercury injections in .. .. [illegible]
— — — [illegible] in 34
— human and bovine, in etiology of tuberculosis [illegible]
— influenzæ, association with ulcerative endocarditis [illegible]
— lepræ, action of radium on .. [illegible]
— [illegible] [illegible]
— pertussis, treatment by 433
— of plague, experiments with .. 437
— proteus, fatal septicæmia due to [illegible]
— pyocyaneus, generalized infection due to [illegible]
— [illegible] Typhoid Fever [illegible]
Back, examination in suspected malingering [illegible]
Backward children, medical gymnastics for 17
— — pineal gland extract for .. 434
Bacteria, effect of hydrogen peroxide on [illegible]
— — [illegible] [illegible]
— iodophile, relative content in intestines [illegible]
[illegible] treatment of [illegible]
[illegible] food poisoning [illegible]
— infections, insect porters of .. [illegible]
— origin of uveitis [illegible]
[illegible] 55
Bactericide, resorcin as a .. [illegible]
[illegible] [illegible]
[illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— osteomyelitis of spine 541
— [illegible] [illegible]
— [illegible] [illegible]
— pellagra .. [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
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[illegible] [illegible]
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Barium sulphate in hypertrichosis [illegible]
— — [illegible] [illegible]
[illegible] [illegible]
Basket-handle operation for nephroptosis [illegible]
Bastedo's sign in diagnosis of appendicitis [illegible]
Baths in Graves' disease .. [illegible]
— [illegible] [illegible]
— — [illegible] of children . [illegible]
— [illegible] [illegible]
— in [illegible] childhood [illegible]
— pemphigus foliaceus .. [illegible]
— [illegible] arthritis [illegible]
[illegible] operation for squint [illegible]
Bayon's culture in leprosy 334
[illegible] 512
Bed-bug as carrier of infection .. 674
— in etiology of parasitic thyroiditis [illegible]
— — [illegible] [illegible]
— -pans, improvements in [illegible]
Bedding manufacture, legal decision re [illegible]
[illegible] thyroidectomy [illegible]
Behring's diphtheria prophylactic [illegible] [illegible]
[illegible] [illegible]
— enuresis .. [illegible]
— [illegible] [illegible]
Bence-Jones' proteinuria .. [illegible]
Benzoate of mercury in syphilis . [illegible]
Benzoates, action of urine on [illegible]
— in urinary infections .. [illegible]
[illegible] [illegible]
— [illegible] [illegible]
Benzol, effect on metabolism in healthy body [illegible]
— in leukæmia [illegible]
[illegible] [illegible]
Beri-beri, [illegible] 133
— [illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]
[illegible] 114
— [illegible] tism .. [illegible]
[illegible] 474
[illegible] [illegible]
— — [illegible] [illegible]
— — [illegible] [illegible]
[illegible] [illegible]
[illegible] 143
[illegible] [illegible]
— [illegible] [illegible]
— [illegible] stostomy .. [illegible]
Biliary tract, [illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]
— [illegible] in infantile diarrhœa .. [illegible]
[illegible] [illegible]
— [illegible] dyspepsia of children . [illegible]
— [illegible] [illegible]
[illegible] pregnancy . [illegible]
Blackwater fever [illegible]
[illegible] [illegible]
— [illegible] [illegible]
Bladder, diseases of [illegible]
— [illegible] treatment in .. [illegible]
— [illegible] [illegible]
— [illegible] 427
— [illegible] 144
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
[illegible] 147

PAGE
Blastomycosis, vaccine-therapy in .. 512
Bleeding in croupous pneumonia .. 442
Blistering in heart disease 282
Blood, Abderhalden's dialysis test .. 180
— changes in infectious diseases .. [illegible]
— clot dressing after mastoid operation 403
— coagulation, effect of radio-active substances on 65
— count in aleucocythæmic leukæmia 336
— — chloroma 337
— — dengue 109
— — diagnosis of typhoid fever .. 641
— — infantile infective anæmia .. 96
— — mumps 368
— — effect of radio-active substances on 64
— — in otitis media 396
— — pellagra 420
— — relapsing fever 543
— — splenomegaly 545
— — tuberculosis 623
— cryoscopy in estimation of renal function 487
— culture in typhus 647
— effect of colloidal copper on 7
— — — iron on 14
— — tuberculin on 75
Blood, examination of 147
— — in cerebrospinal syphilis 587
— — diagnosis of scarlet fever.. .. 500
— — kala-azar 332
— — malaria 351
— injections in hæmorrhages of the newly-born.. 273
— occult, in diagnosis of cancer .. 182
— picture of cancer of bone-marrow and pernicious anæmia 98
— platelets, origin of 147
Blood pressure 153
— — effect of pituitary extract on .. 23
— — — tyramine on 32
— — high, and arteriosclerosis.. .. 121
— — in nephritis 373
— — rheumatoid arthritis 123
— — scarlet fever 500
— — thoracic aneurysm 109
— — treatment of hyperpiesis 154
— serum in diagnosis of cancer.. .. 182
— stream, bacilli in, in tuberculosis .. 622
— transfusion of defibrinated, in severe anæmia 4
— — in extra-uterine gestation .. 455
— — pellagra 418
— vessels, anastomosis of 119
Blue brain 548
Boiling-water injections in hyperthyroidism 606
Boils in ear, to abort rapidly 217
— general and local treatment 254
— ichthyol for 511
— ionic medication in 59
— serum treatment of 27
— vaccine treatment of 36
Bone diseases, infectious, vaccine therapy in 36
— formation in penis 428
— marrow, carcinoma of, in relation to pernicious anæmia 98
— marrow tabloids in pellagra 418
— transplantation for nasal deformity.. 381
Bones, metastatic nodules in, with proteinuria.. 464
Bony conditions, x-ray diagnosis of .. 43
Books of the year 733
Boracic acid in otitis media 349
— — as a urinary antiseptic 33
— — in urinary infections 655
— starch poultices in eczema 221
Borated talc in moist dermatoses .. 510

PAGE
Borax and glycerin mouth applications in measles 363
Borcholin in tuberculosis .. 4
Bordet's bacillus in treatment of pertussis [illegible]
Botryomycosis .. 154
Bougies, electric, in gonorrhœa 268
— in tinnitus .. 613
Bovine bacillus in etiology of surgical tuberculosis 636
Bowels, regulation of, in asthma of children 130
Boyce's caliper-guide for bronchoscopy 167
Bradycardia with lead colic .. 279
Brain, surgery of .. .. .. [illegible]
— abscess of 155
— — due to amœbæ 91
— extract for dementia .. 725
— fag, avoidance in spinal curvature .. [illegible]
— injuries to, causing diabetes insipidus 200
— tumours of, results of operation .. 156
Bran baths in pemphigus foliaceus .. 428
— in diet to prevent constipation .. 198
Branchial fistula, ionic medication in .. 59
Brass-workers' itch and ague 686
Breast, cancer of 160
— — modified operation for 162
— — radiotherapy in 51
— — vertebral tumours secondary to.. 520
— — x-rays in post-operative prophylaxis 46
— feeding, cotton-seed extract as aid in 7
— milk, estimate of consumption of .. 268
Brennemann's experiments in curd formation 270
Bright's disease (*see* Nephritis) .. 373
Brill's disease, identity with typhus .. 647
Bromide of strontium in Graves' disease 294
Bromides in arteriosclerosis 122
— asthma of children 130
— chorea 455
— to diminish hypersecretion 503
— for insomnia during lactation 298
— in insomnia from eczema 220
— phrenocardia 279
— thoracic aneurysm 111
— tinnitus.. 613
Bronchial glands, tuberculosis of 162
— pus, excretion of urotropin in .. 13
— spasm, caffeine in 5
Bronchiectasis, anæsthesia in operation for 346
— bronchoscopy in 170
— solidification of lung in surgery of .. 348
Bronchitis 164
— endo-bronchial treatment of.. .. 224
— erythræmia a bad sign in 453
— factors causing in stout people .. 166
— vaccine therapy in 165
Bronchopneumonia, colloidal silver in .. 29
Bronchoscope, direct applications through in asthma and bronchitis 224
Bronchoscopy 166
— anæsthesia in 169
— indications for.. 170
— in removal of foreign bodies 347
Bronchus, foreign bodies in 347
Bronquet's mask, to wear in treating plague cases 420
Brown's tuberculin B.F. Co. 72
Brytstele and asepsis of instruments .. 689
Bubo, climatic 171
Bucket and dilator in pyloric stenosis .. 475
Buerger's urethroscope in gonorrhœa .. 267
Bulkley's rice diet in eczema 220
Bullet wounds of abdomen 84
Burnam's test for free formaldehyde in urine 13
— — in urinary infections 655
Burns, ichthyol in.. 511

PAGE

[illegible] of the œsophagus .. 388
[illegible] tuberculosis .. 72
Bursitis, subdeltoid .. 171
Buttermilk in gastro-enteric diarrhœa .. 206
— treatment of erysipelas .. 211
Butlin's operation for marginal resection of tongue .. 614
[illegible] test for albumin in cerebrospinal fluid .. .. [illegible]

CHARTERIS, F. J., 1; Collie, Sir J., [illegible]; Coombs, C. F., [illegible], 114, 121, [illegible], [illegible], [illegible], 212, 224, [illegible], [illegible], [illegible], 42[illegible], [illegible]

Cabinet (combination) for ward or surgery [illegible]
— [illegible] .. 692
Cacodylate of soda in pellagra .. [illegible]
Cacodylic acid in psoriasis .. [illegible]
Cade, oil of, in psoriasis .. [illegible]
Cæsarean section in eclampsia .. 457
— — indications and technique .. [illegible]
Caffeine for headache during lactation .. [illegible]
— pneumonia 443
— relieving bronchial spasm .. [illegible]
Caisson disease 172
— — etiology 172
— — pathology .. .. .. 17[illegible]
— — treatment 174
Calamine lotion in lupus erythematosus [illegible]
Calcinosis, multiple subcutaneous 174
Calcium chloride in hæmorrhages of the newly-born 272
— lactate in tetany after thyroidectomy 264, 606
— salts in epilepsy .. .. [illegible]
Calculous anuria, surgical treatment [illegible]
Calculus in Egypt, incidence of .. .. 14[illegible]
— renal .. .. [illegible]
— — x-ray diagnosis of 44
— ureteral, oil injections for [illegible]
— vesical .. .. .. 14[illegible]
Caliper guide for use in bronchoscopy .. [illegible]
— splint for fractured femur [illegible]
Calomel and bismuth in infantile diarrhœa [illegible]
— in functional derangement of the liver [illegible]
— intestinal dyspepsia of children [illegible]
— ointment in psoriasis .. [illegible]
— in phlyctenular conjunctivitis [illegible]
— pyelitis of children .. [illegible]
— for stout bronchitics .. [illegible]
Camphor, chloral, and menthol in fibrositis [illegible]
— and lupulin in phrenocardia .. [illegible]
— and picric acid in ringworm .. [illegible]
— therapeutic value of .. [illegible]
Cancer [illegible]
— [illegible] test in [illegible]
— [illegible]
— [illegible] interscapulo-thoracic amputation for .. [illegible]
— [illegible]
— of the bladder .. [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— — modified operation for .. [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible] of metallic salts of .. [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible] radiotherapy at .. [illegible]
— [illegible]
Cancer, laboratory diagnosis of [illegible]
— [illegible]

Cancer, new methods of diagnosis .. 17[illegible]
— of the œsophagus 385
— — surgical treatment .. [illegible]
— pathology 176
— of the prostate 461
— rectum, charts showing extension of 4[illegible]
— — Kraske's operation for 481
— — radiotherapy in .. [illegible]
— skin 507
— — inoperable, x-rays in [illegible]
— — mesothorium in .. [illegible]
— — radiotherapy in 51
— — x-ray treatment in 47
— [illegible] .. 17[illegible]
— of spinal cord 519
— stomach .. [illegible]
— — analysis of duodenal contents in [illegible]
— — diagnosis of fibromatosis from .. 556
— — relation to ulcer 256
— — results of surgical operation .. 552
— tongue 614
— thryoid discovered on operation .. 607
— treatment 176
— of uterus 659
— — disappearance of glycosuria after removal 205
— — radiation in 65
— x-ray treatment of 46
Cancerous stenosis of œsophagus, intubation in 170
Cantharidin and gold combinations in tuberculosis .. [illegible]
Canvassing [illegible] medical officers [illegible]
Carbenzyme, action on necrosis, cyst contents, etc. [illegible]
Carbohydrate fever in children .. [illegible]
— limitation in Graves' disease .. 24[illegible]
— metabolism, effect of pituitary gland on .. .. [illegible]
— [illegible]
— restriction in functional derangement of the liver .. [illegible]
Carbolic acid in eczema .. [illegible]
— — [illegible] [illegible]
— lotion, method of applying in pediculosis .. 415
— [illegible]
Carbon dioxide snow in [illegible]
— — — [illegible] [illegible]
— — — eczema .. [illegible]
— — — epithelioma of skin [illegible]
— — — lupus erythematosus .. [illegible]
— — — [illegible] [illegible]
— — — [illegible] [illegible]
[illegible]
— magnesia in lupus erythematosus .. [illegible]
Carbuncle, general and local treatment [illegible]
— [illegible] [illegible]
— ionic medication in .. [illegible]
— [illegible] [illegible]
— vaccine therapy in [illegible]
Carcinoma. See Cancer
Cardiac arrhythmias (see Auricular Fibrillation)
— disease, auricular flutter in .. [illegible]
— [illegible]
— — [illegible] 275
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]

PAGE
Cardiac stimulation in croupous pneumonia 442
— strain in anæsthesia 107
— symptoms of aneurysm 109
Cardiolysis in pericarditis .. 42[illegible]
Cardio-pulmonary cases, polycythæmia with 453
Cardiosclerosis and heart-block 288
— sugar in treatment 283
Cardiospasm (*see* Œsophagus) 390
Carditis, otitis with 396
— syphilitic (*see* Heart, Syphilis of) .. 275
Carious teeth in etiology of gastric cancer 549
Carlsbad salts in functional derangement of the liver.. 343
— Sprudel salt, imitation of 726
Cascara in arteriosclerosis 122
— infantile eczema 221
Casein, precipitated, in infant feeding .. 301
Castor oil in prophylaxis of arteriosclerosis 121
— — for stout bronchitics 166
Casts passed during menstruation .. 366
— in urine, importance in diagnosis .. 658
Catalepsy, suggestion treatment in .. 565
Catalysis, leptynol as stimulant of .. 15
Cataract 183
Cataract, pathology of 184
Catarrh of Eustachian tube 395
— nose and throat, vaccines in .. 383
— fermentative intestinal, oxygen insufflation for 20
— spring, radium in 233
Catarrhal jaundice in children 308
— — urotropin in 12
Catheterization in cancer of prostate .. 462
Catheters, formaldehyde in sterilization of 10
— ureteric, silk web 692
Cautery, in cancer of cervix uteri .. 661
Cavernous angiomata, carbon dioxide snow in 513
— sinus, thrombosis of 408
Cell proliferants after mastoid operation 403
Cellulitis, colloidal iron in 14
— vaccine therapy in 36
Cellulose, diet rich in, in prevention of constipation 197
— intestinal digestion of 235
Central retinal artery, obstruction of .. 488
Cereal gruels in infant feeding 301
Cerebellar abscess, differentiation from labyrinthitis 326
Cerebral lesions, relative to diabetes insipidus 200
— tumours 155
— — results of operation 156
Cerebrospinal fever 186
— — diagnosis and treatment 187
— — prophylaxis 188
— — symptoms 186
Cerebrospinal fluid 188
— — biological and drug tests.. .. 190
— — cytology 190
— — examination in otitic meningitis 405
— — in mumps 369
— — signs of syphilitic infection .. 190
— — tests for albumin 189
— syphilis 586
— — luetin reaction in 571
Cerettes (containers for ointments and soaps) 726
Cervical abscess 404
— glands, tuberculous, bovine and human bacilli in 636
Cervix uteri, amputation of, after-results 661
— — incidence of laceration of .. 323
— — radiotherapy in cancer of .. 53
Chair, the "Grevillite" folding .. 663
Chalazion, radium in 233

PAGE
Charcoal in intestinal dyspepsia of children .. 21[illegible]
Cheilotomy for osteo-arthritis of hip joint 294
Chemistry of the blood 140
Chemotherapy combined, experiments on 27
Chilblains, galvanic current for .. 4
Children, anaemia in .. [illegible]
— asthma in .. [illegible]
— backward, medical gymnastics for .. 17
— — pineal gland extract for .. 434
— cardiac efficiency in .. .. 27[illegible]
— diseases of, general review of .. .. [illegible]
— — massage in .. .. [illegible]
— duodenal ulcer in .. [illegible]
— errors of accommodation in .. 484
— fracture of neck of femur in .. 2[illegible]1
— gall-stones in 137
— heart disease in 281
— intestinal dyspepsia of (*see* Dyspepsia) 214
— jaundice in 308
— mechanical measures in bronchitis in 1[illegible]4
— mentally deficient, legal decision re 682
— nephrolithotomy in 316
— pyelitis in 469
— radical mastoid operation in.. 401
— rheumatoid arthritis in .. 123, 124
— rheumatism in.. .. .. . 4[illegible]1
— rheumatic, special homes needed for 282
— siphon drainage in empyema of .. 222
— syphilis in relation to deafness in .. 21[illegible]
— tuberculosis in.. 623
Children's Act, operations under .. 671
Chloasma. sulphur in 510
Cholin, borcholin a non-toxic preparation of 4
Chloral in chorea 495
— camphor, and menthol in fibrositis .. 238
— in insomnia from eczema .. .. 22[illegible]
— thoracic aneurysm 111
Chloride of ammonium inhalers, new designs 703
— -free diet in epilepsy .. .. .. 22[illegible]
Chlorine ionization in acute fibrositis .. 240
Chlormetacresol, an active antiseptic .. 6
Chloroform anæsthesia, causes of death under 106
— belladonna and aconite in fibrositis 239
Chloroma .. .. 33[illegible]
Cholecystectomy in typhoid carriers .. 646
Cholecystostomy, biliary obstruction after 138
Cholecystitis, infective, early operation in 136
Choledocho-duodenostomy, indications for 137
Cholelithiasis, analysis of duodenal contents in 412
Cholesterin in anæmia in children .. 97
— blood, significance of 140
— pathology of cataract.. .. .. 1[illegible]5
Cholera 191
— epidemiology of 191
— treatment 192
Choleraic diseases, copper preparations in 7
Chordee, aconite to diminish tendency to 267
Chorea, clinical manifestations .. .. 4[illegible]3
— salvarsan in 27
— treatment 495
Choroid, diseases of 306
Christian Science cures and autosuggestion 562
Chromaffin system, relation to diabetes 2[illegible]2
— tissues, degeneration caused by radioactive substances .. .. .. 6[illegible]
Chrysarobin in psoriasis .. .. .. 4[illegible]
— ringworm .. .. 4[illegible]7
Chylous cysts of mesentery 368
Ciliary body, diseases of .. [illegible]
Cimex in etiology of parasitic thyroiditis 2[illegible]1
Cinchona alkaloid, amorphous, in malaria 353
Circulation, peripheral, stasis of .. [illegible]

PAGE
[illegible], tuberculosis due to [illegible]
[illegible] of the liver [illegible]
— — relation of spleen to [illegible]
— — [illegible] [illegible]
— [illegible] stomach, [illegible] of [illegible]
Citrate of potassium in cholera .. [illegible]
— — in enuresis .. [illegible]
— — pyelitis of children [illegible], 474
— [illegible] in [illegible] detachment of retina [illegible]
Citrate in urinary infections [illegible]
Citrated milk in infant feeding [illegible]
Citramine, action as urinary antiseptic .. [illegible]
Clamps, new makes of .. [illegible]
Clip for holding [illegible], new design [illegible]
Clothing in fibrositis [illegible]
Coagulation time of blood [illegible]
— — — effect of radio-active substances on [illegible]
Coagulose, hæmostatic ferment from horse serum .. [illegible]
Cocaine in [illegible] 443
Cocaine-adrenalin, direct injections in asthma and bronchitis [illegible]
Cocainism, suggestion treatment of [illegible]
Cock's-comb test of ergot activity [illegible]
Codeine, paracodin a substitute for [illegible]
Cod-liver oil contraindicated in intestinal dyspepsia in children .. [illegible]
— — in convalescence from heart disease [illegible]
— — infant feeding 302
— — phlyctenular conjunctivitis [illegible]
— — spinal curvature .. [illegible]
— — tuberculosis in childhood .. [illegible]
Colalin in functional derangement of the liver 343
Cold, common, vaccine therapy in [illegible]
Coli bacilluria, vaccine therapy in [illegible]
Colic, renal .. [illegible]
Colitis, Abderhalden's test in [illegible]
— character of fæces in .. [illegible]
— in children [illegible]
— fermentative, oxygen insufflation for [illegible]
— ionic medication in .. [illegible]
— from pericolic membranes [illegible]
— urotropin in .. [illegible]
Collapse induration, diagnosis from phthisis [illegible]
— of lung, technique of effecting, in tuberculosis 445
— — in treatment of tuberculosis 345
[illegible]
[illegible] in renal skiagraphy, effects caused by .. 44
— therapeutic indications [illegible]
Colles's fracture, results of treatment [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] 192
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Complement fixation in diagnosis [illegible]
— — gonorrhœa .. [illegible]
Compression and decompression in caisson disease [illegible]
— of spinal cord .. [illegible]
Concussion of spinal cord 519
Congenital anomalies of the kidney [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— heart malformation [illegible]
— hypertrophic stenosis of pylorus, x-ray diagnosis of [illegible]
— pyloric stenosis [illegible]
— syphilis .. [illegible]
— — [illegible] [illegible]
— [illegible] [illegible]
Conjunctiva, diseases of [illegible]
— tuberculosis of [illegible]
Conjunctivitis, hydrogen peroxide in [illegible]
— infection in swimming-bath .. [illegible]
— Parinaud's [illegible]
— phlyctenular [illegible]
Constipation [illegible]
— [illegible] 111
— children, massage in .. [illegible]
— gastric cancer .. 549
— suggestion treatment in [illegible]
[illegible] quarries [illegible]
Continuous dilatation in urethral stricture .. [illegible]
Contraction ring, dystocia due to [illegible]
Contractions, spastic, resection of nerve roots for [illegible]
Contracture of neck of bladder .. [illegible]
— of prostatic orifice, operation for [illegible]
[illegible]
Copaiba in chronic gleet .. [illegible]
— psoriasis [illegible]
Copper, colloidal, in cancer [illegible]
— preparations in intestinal disorders .. 7
— salts in tuberculosis in childhood .. 628
— sulphate in [illegible] [illegible]
Corbett's test for amylolytic ferment in urine 658
Cord-pressure signs in extramedullary tumours 521
Cornea, diseases of 198
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] 7
Cough [illegible]
— [illegible]
— paracodin as a sedative in .. [illegible]
[illegible]
Cranial [illegible] [illegible]
Cran[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] epilepsy .. 231
[illegible]
[illegible]
[illegible]
[illegible]

PAGE
Curd formation in boiled and unboiled milk [illegible]
Curettement of Eustachian tube in chronic aural suppuration [illegible]
— — after mastoid operation [illegible]
Cupping in cholera [illegible]
Cuprakrol, copper ointment for skin affections 726
Cuprammonium sulphate in cancer .. 180
Curette sharpener [illegible]
Curvature of spine, treatment by exercises 528
Cutaneous epithelioma, x-ray treatment of 47
— reaction in diagnosis of syphilis 570
Cyanide of gold and potassium in syphilis 581
Cycloform, co., ung., as emollient .. 726
Cymarin as a cardiac tonic 284
Cyst contents, action of carbenzyme on 6
— hydatid, of spinal cord 520
Cysts of bone, x-ray diagnosis of .. 43
— connected with hernial sacs 290
— of the liver 341
— mesentery 368
— ovarian, complicating, pregnancy, etc. 409
— of the spleen 543
— sebaceous, electrolysis in destruction of 513
Cystic hygroma of neck 373
Cystitis, hexal in 12
— of pregnancy 145
— relation of albumin to pus in .. 658
Cystopurin, action as urinary antiseptic 33
Cystoscopy in cancer of cervix uteri .. 659
— diagnosis of renal tuberculosis .. 318
— in dysuria in women 145
— importance with vesical tumour .. 140
Cystotomy, technique in cases of vesical tumour 140
— in vesical calculus, advantages of .. 144
Cytology of blood examination 147
— cerebrospinal fluid 190

DACRYOCYSTITIS 328
"Dämmerschlaf" with sacral anæsthesia 108
Damming and percussion in fracture .. 244
Darier's disease 310
Deafness (*see* Ear, Diseases of) 216
— in children, relation of syphilis to .. 218
— middle-ear, as cause of vertigo .. 666
— from nerve degeneration 327
— simulated 218
Decapsulation of kidneys in eclampsia .. 457
Decompression operation for meningitis 405
Delirium tremens, aleudrin in 3
Dementia, brain extract in 725
— paralytica (*see* Syphilis, Cerebrospinal) 586
— præcox, Abderhalden's test in .. 152
Dengue 199
— relation of sand-fly fever to .. .. [illegible]
Deodorant, noviform as a 19
— ozoline as a 730
— ozone as a 21
Depilatories in hypertrichosis 295
Depilatory effect of x-rays 50
Depression, aleudrin as sedative in .. 3
Dermatitis herpetiformis, human blood injections in 512
— in pregnancy, serum treatment .. 457
— (traumatic) and eczema 222
Dermatogra, a symptom of pellagra 417, 426
Dermatol in eczema 221
Dermatology, general review of 79
Dermatoses, moist, dry treatment of .. 510
Desiccated corpora lutea for artificial menopause 366
Dextrose in rectal feeding 483
Diabetes, Abderhalden's dialysis test in 150
— amylolytic ferment test in 655
— analysis of duodenal contents in .. 412

PAGE
Diabetes a cause of intermittent limp 122
— general review of 82
— Wassermann reaction in [illegible]
Diabetes insipidus .. 200
Diabetes mellitus .. .. [illegible]
— — in early infancy .. [illegible]
— — influence of alcohol on [illegible]
— — radio-active substances contra-indicated in [illegible]
Diabetic asphyxia, oxygen injections in [illegible]
— foods, new preparations of .. 727
Diabetics, operation for gangrene in [illegible]
— operations on .. .. .. [illegible]
Diachylon and plumbism [illegible]
Diagnosis, tuberculin in 7
Diagnostic value of gastric antiperistalsis 41
Dialysation method in diagnosis of pregnancy .. .. [illegible]
Dialysis blood test of Abderhalden .. [illegible]
Diaphoresis in eye disease .. .. [illegible]
Diarrhœa, copper preparations in .. 7
— false, character of fæces in 236
Diarrhœa of gastric origin .. 205
Diarrhœa, infantile 207
— — diet in .. .. [illegible]
— suggestion treatment in .. .. [illegible]
— value of uzura in 33
Diastase in fæces test for, in pancreatitis 411
Dictionary of materia medica and therapeutics 1
— of treatment 77
Diet in angina pectoris 114
— aortic aneurysm 111
— arteriosclerosis 121
— and beri-beri 133
— in cirrhosis of the liver 341
— congenital pyloric stenosis 475
— diabetes 202
— eczema 220
— epilepsy 229
— etiology of pellagra 420, 425
— functional derangement of the liver 342
— gastrogenic diarrhœa 206
— gout 270
— Graves' disease 264
— heart disease 253
— hyperpiesis 154
— infantile anæmia 97
— — diarrhœa 208
— infants' 207
— in intestinal dyspepsia in children .. [illegible]
— jaundice in children .. .. .. [illegible]
— nephritis 375
— nephrolithiasis 315
— prevention of constipation .. .. [illegible]
— pyelitis of children 474
— rectal 483
— in rheumatoid arthritis 125
— for stout bronchitics .. .. .. [illegible]
— in surgical tuberculosis .. .. [illegible]
— treatment of pellagra .. .. [illegible]
— tuberculosis in childhood .. .. [illegible]
— typhoid fever .. .. [illegible]
Digalen, emetic and nauseant effect of .. [illegible]
— new forms of 727
Digitalis in auricular fibrillation 131
— auricular flutter 132
Digestion, relative activity in intestines [illegible]
Digestive symptoms of angina pectoris, treatment 114
— — pellagra .. .. .. 417, [illegible]
Digesto-laxative tabellæ for chronic dyspepsia 727
Digipuratum, emetic and nauseant effect of 8
Digitalin in angina pectoris 114
— tabloids 727
Digitalis in croupous pneumonia .. 442
— therapeutic action of .. .. .. [illegible]
— — possibilities of .. .. .. [illegible]

PAGE
Digitalis tincture, standardized [illegible]
Digitalysatum, emetic and nauseant effect of [illegible]
Digitonin, removal from digitalis of .. 8
Digitoxin, elimination from tissues of .. 8
Dilatation, acute, of stomach [illegible]
— continuous, in urethral stricture .. 652
— of Eustachian tube, method of [illegible]
— stomach, post-operative [illegible]
Dimethyl method of estimating blood-serum alkalinity [illegible]
Dioradin in surgical tuberculosis .. 8
Diphtheria [illegible]
— antitoxins, review of 81
— Behring's new prophylactic [illegible]
— carriers, [illegible] sprays in [illegible]
— — [illegible] sprays in [illegible]
— colloidal silver in [illegible]
— [illegible] injections of [illegible]
— and heart block [illegible]
— otitis in 396
— [illegible] of larynx following [illegible]
Diphtheritic ulceration, ionic medication in [illegible]
Diplosal (salicylo-salicylic acid) 9
Diseases classed as accidents 671
Dispensaries, tuberculin, growth of [illegible]
Disinfectant, alcoholic solution of iodine as .. 14
— ozone of little value as [illegible]
— value of formaldehyde as a .. [illegible]
Disinfecting of skin, alcoholic kaolin paste in .. [illegible]
— intestine, oxygen insufflation for [illegible]
Dissecting aneurysm, cause of .. [illegible]
Disseminated ulcerative sporotrichosis [illegible]
Diuresis in heart disease .. [illegible]
— pituitary extract causing [illegible]
[illegible]
— value of squill as [illegible]
Diverticulitis, diagnosis [illegible]
— of the sigmoid .. [illegible]
Division of auditory nerve in tinnitus .. [illegible]
Dixon's tuberculin [illegible]
[illegible]
[illegible]
[illegible]
Douches in gonorrhœal arthritis .. [illegible]
Dover's powder in intestinal dyspepsia of children .. [illegible]
[illegible]
[illegible]
[illegible]
[illegible] 701
[illegible]
[illegible]
[illegible] squill in
[illegible]
— — suggestion treatment of .. [illegible]
Dry cupping in cholera .. [illegible]
[illegible]
[illegible]
Ductus arteriosus, persistent [illegible]
[illegible]
[illegible]
[illegible] 41
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Duodenum and stomach, surgery of [illegible]
[illegible] 555

PAGE
Dural drain in otitic meningitis [illegible]
Dysentery, amœbic [illegible]
[illegible]
— bacillary, vaccine therapy in [illegible]
— colloidal silver in [illegible]
Dysentery, flagellate [illegible]
— uzara in diarrhœa of .. [illegible]
[illegible]
[illegible]
— synthetic hydrastinin in [illegible]
[illegible]
[illegible] 114
[illegible] 727
[illegible]
[illegible]
Dyspepsia (intestinal) of children [illegible]
[illegible]
[illegible]
Dyspituitarism, classification of .. [illegible]
Dyspnœa, bronchoscopy in .. .. [illegible]
— in diagnosis of thoracic aneurysm .. [illegible]
[illegible]
[illegible]
Dystopic kidney [illegible]
[illegible] body and 435
Dwarfism, mitral [illegible]
Dysuria in women [illegible]

EAR, affections of, [illegible]
— — in chloroma .. 336
— — after salvarsan treatment [illegible]
— catarrh of, diagnosis .. [illegible]
Ear, diseases of [illegible]
— [illegible] 400
— functional and simulated affections of [illegible]
— [illegible]
— [illegible]
— [illegible]
Ear, syphilis of [illegible]
Eclampsia .. 456
— amylolytic-ferment test in .. [illegible]
Ectopic pregnancy 455
Eczema [illegible]
— association with occupations .. [illegible]
— [illegible]
— chronic pyogenic, vaccine-therapy in [illegible]
— human blood injections in .. [illegible]
— in infants [illegible]
[illegible] 407
— new method of applying sulphur in .. 31
— [illegible] 507
— [illegible]
— x-ray treatment [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

PAGE
Electrolysis in tinnitus .. [illegible]
Electrodes, the "[illegible]" .. [illegible]
Electrotherapeutics .. [illegible]
— in lumbago .. [illegible]
— simple solitary ulcer of bladder .. 147
— tinnitus .. [illegible]
— vesical papillomata .. 141
Elephantiasis .. [illegible]
Ellermann-Erlandsen test in tuberculosis .. [illegible]
Elixirs, new .. 727
Embolism of central retinal artery 488
— post-operative 392
Embryotomy in contraction ring 325
Emetic effect of digitalis bodies 8
Emetine 728
— in pulmonary hæmorrhage 635
— as specific in amœbic dysentery .. 83, 91
Emmenagogue oils, small therapeutic value of 9
Emphysema, anæsthesia in operation for .. 346
Emphysematous gangrene 254
Empyema .. .. .. [illegible]
— anæsthesia in operation for 346
— in children, value of siphon treatment 222
— operation for 346
Encephalitis, hæmorrhagic, after salvarsan 26, 28
Endobronchial treatment .. 224
Endocarditis, infective, colloidal silver in 29
— obstruction of central retinal artery in 488
Endocarditis, ulcerative (or lenta) 224
— — bacteriology 224
— — pathology 225
— — prognosis and treatment 227
— — symptoms 226
Endometritis, ionic medication in .. 59
Endosteal tumours, *x*-ray diagnosis of .. 43
Endotheliomata of spinal cord 521
Enemata, nutrient 483
Enesol injections in psoriasis, value of .. 465
— in tabes 592
Entamœbæ, varieties of 90
Enteric fever (*see* Typhoid)
Enteritis, Abderhalden's test in .. 152
— in children 214
Enteroliths complicating *x*-ray diagnosis 41
Enteroptosis, etiology and treatment .. 667
Enucleation of tonsils in rheumatism in childhood 494
Enules, epinine preparation in 728
Enuresis 228
— with pyelitis in children 472
— suggestion treatment in 566
Eosinophilia characteristic of dengue .. 199
— with sporotrichosis 547
Epidemic pneumonia 443
— poliomyelitis 450
Epidemiology of cholera 191
Epidermophyton inguinale in etiology of ringworm 497
Epididymitis, gonorrhœal, vaccine therapy in 35
— recurrent, vasotomy for 504
Epidural injections in enuresis 229
Epiglottic suture, modified instrument for 329
Epilepsy .. .. [illegible]
— surgical treatment of 159, 230
— usually intractable to suggestion .. 564
Epileptics, thyroid deficiency in some .. 230
Epileptiform attacks with heart-block .. 288
Epinephrin (*see* Adrenalin)
Epiphyseal fracture of femoral head .. 251
Epithelioma (*see* Cancer)
Erasion and skin-grafting in arsenical cancer 119
Ergot in enuresis 229
— Graves' disease 264
Ergot, qualitative tests of .. [illegible]
Ergotoxin, cock's-comb test of .. [illegible]
Eruption of pellagra .. [illegible]
Eruptions, erythematous, in typhoid fever .. 639
Erysipelas, buttermilk treatment of [illegible]
— colloidal iron in .. [illegible]
— ichthyol in .. [illegible]
— in infants, vaccine therapy in .. [illegible]
— leucocyte extract in .. [illegible]
— after mastoid operation .. 404
— removal of adenoids .. [illegible]
— vaccine therapy in .. .. 36, [illegible]
Erystypticin in uterine hæmorrhage [illegible]
Erythema .. .. [illegible]
— — ab igne .. .. [illegible]
— complicating infectious diseases 232
— multiforme, vaccine therapy in .. [illegible]
Erythema nodosum .. 232
Erythematous eruptions in typhoid fever 639
Erythræmia (polycythæmia) .. [illegible]
Erythrocytosis megalosplenica .. 453
Ether anæsthesia, new appliances for .. [illegible]
— in intravenous anæsthesia 107
— and morphia in renal colic [illegible]
— with nitrous oxide in major surgery [illegible]
Ethmoiditis, suppurative, choice of operation for .. .. .. [illegible]
Ethyl chloride freezing in epithelioma of the skin .. .. [illegible]
Ethylhydrocuprein in croupous pneumonia .. .. [illegible]
Eucaine injections in sciatica .. [illegible]
Eucalyptus oil in measles .. .. [illegible]
Eustachian tube, catarrh of 395
— — curettement for chronic aural suppuration 400
— — — after mastoid operation .. 403
Exanthematic otitis 396
Exercise in fibrositis .. .. .. [illegible]
— functional derangement of the liver [illegible]
— heart-block 289
— importance in prophylaxis of gout .. 271
— for stout bronchitics .. .. .. [illegible]
Exercises, re-educative, in chorea .. 495
— in spinal curvature 528
Exfoliative action of resorcin .. [illegible]
— — salicylic acid 508
— dermatitis, dry method of treatment [illegible]
Extension with operation for fracture .. [illegible]
Exophthalmic goitre .. [illegible]
— — Abderhalden's test in .. 152
— — anæsthetic in operation on 609
— — the question of operation 607
— — radio-active substances contra-indicated in .. [illegible]
— — radiotherapy beneficial in 54
— — role of thymus in 610
— — *x*-rays in .. .. .. [illegible]
Exophthalmos in chloroma .. 336
— often absent in Graves' disease 263
Expectorant, "mesbé" as an .. 18
Expectorants for stout bronchitics .. [illegible]
Extracutaneous sporotrichosis .. [illegible]
Extramedullary tumours of spinal cord 520
Extranasal operation for suppurative ethmoiditis .. .. .. [illegible]
Extra-uterine gestation .. 455
Extravertebral tumours of spinal cord 520
Eye affections in chloroma .. [illegible]
— complications of leprosy .. 334
— diseases, general review of .. 82
— douche, new design .. [illegible]
Eye, general therapeutics of [illegible]
— instruments, pocket case of .. [illegible]
Eyeball enucleation, local anæsthesia for 234
Eyelid retractor, new design 713
Eyes, artificial, the "Eukoric" .. [illegible]

PAGE

FALTA, W., 60; French, H., 86, 98, [illegible]

[illegible]

Factory and Workshop Act, decision under [illegible]

Fæces, examination of [illegible]

— in diagnosis of cancer [illegible]

— diastase in, in pancreatic disease .. 411

— in [illegible] diarrhœa [illegible]

— importance of examination in amœbic dysentery [illegible]

— intestinal dyspepsia of children [illegible]

— jaundice in children 308

Familial dystrophy of hair and nails .. 274

— [illegible] anæmia [illegible]

Fat, abnormal distribution of [illegible]

— digestion in intestine [illegible]

— restriction in functional derangement of the liver [illegible]

— — in jaundice in children 309

— splitting ratio in diagnosis of pancreatitis [illegible]

Favus (see Ringworm)

— anchorion violaceum a new variety of 497

Feeding of infants.. 297

— — general review of 78

Fehling's test for albumin in cerebrospinal fluid.. 190

Femur, fractures of 244, 246

Ferments in blood, estimation of .. 149

— of the body, effects of thorium on [illegible]

— urine, test for.. 658

Fermentation, intestinal, reaction of fæces in 235

Fermentative dyspepsia and catarrh, oxygen insufflation for 20

Ferrous iodide in rheumatoid arthritis.. 125

Fever, radio-active substances contra-indicated in [illegible]

Fibrillation, auricular 130

Fibroid tumours of spinal cord 521

Fibroids, Cæsarean section for 324

— danger increased with age in [illegible]

Fibrolysin in fibrositis 238

— multiple subcutaneous [illegible] [illegible]

Fibroma, nasopharyngeal, operation for 382

Fibromatosis of stomach.. 556

[illegible] of bladder, operation for [illegible]

Fibrositis [illegible]

— general and local treatment.. .. 238

— pathology and etiology [illegible]

Filtration of x-rays, experiments in .. 45

[illegible]

Finsen light disappointing in lupus erythematosus [illegible]

— — results at the London Hospital .. 54

Fistula after appendicitis, vaccine therapy 36

— noviform in 20

— [illegible]

[illegible]

[illegible]

[illegible] with rheumatoid arthritis [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Fluid intake, reduction in hyperpiesis .. 154

[illegible]

[illegible] on 583

[illegible] in [illegible]

[illegible], vaccine-therapy in [illegible]

Fomentations in fibrositis 238

Food (*see* Diet)

— adulteration, legal decisions re .. 677

— fever in children 215

— poisoning and infections, bacterial .. 673

— — uzura in diarrhœa of 33

— [illegible] [illegible]

Foot and mouth disease in man.. . .. 241

Forceps, new designs in 697

— tonsil, new design [illegible]

Foreign bodies in bronchi and lungs .. 347

— — thorax, x-ray localization of [illegible]

[illegible]

Formaldehyde baths in keratodermia blennorrhagica 310

— — as [illegible] for [illegible] workers 687

— inhalants, improved 728

— in urine, Burnam's test for 10

— — tests for [illegible]

— value as a disinfectant [illegible]

Formalin-glycerin injection in empyema 224

Fowler's solution in pellagra [illegible]

Fractures [illegible]

— femur 244, 246

— instrument for use in operation on 698

— leg bones [illegible]

— [illegible] [illegible]

— operative treatment of [illegible]

— of ribs, indications for operation [illegible]

— screw and screw-driver for operative treatment of [illegible]

— simple, report of B.M.A. Committee 242

— of spine of tibia [illegible]

— [illegible]

— upper limbs, results of treatment .. [illegible]

— wrist 252

Frambœsia, luetin reaction in .. [illegible]

Franke's operation for visceral crises [illegible]

Freezing by ethyl chloride in epithelioma of [illegible]

[illegible]

Fresh-air treatment of surgical tuberculosis.. [illegible]

Friedmann's claims for tuberculosis vaccination.. [illegible]

Friendly societies, canvassing for medical officers by .. [illegible]

Frostbite, ichthyol in 511

Fuchsin, basic, in chronic ulcers [illegible]

Fuchsine medicinal (Merck's), in chronic ulcers [illegible]

Fulguration in simple solitary ulcer of bladder [illegible]

Fumigator, the "Gonin" [illegible]

Fungi, rôle of, in sprue .. [illegible]

[illegible] ing sulphur in [illegible]

Furunculosis [illegible]

— [illegible]

— [illegible]

— [illegible]

— [illegible]

G[illegible]

[illegible]

— [illegible]

— [illegible]

— [illegible]

PAGE
Gall-bladder, surgery of 136
"[illegible]" peritonitis without perforation of biliary tract 136
Gall-stones, analysis of duodenal contents in 412
— in children 137
— x-ray diagnosis of . . . [illegible]
Galvanic current for chilblains 54
Galvanized iron water pipes, poisoning due to 673
Galvano-cautery in cancer of cervix uteri 661
Galvano-puncture in lupus erythematosus 350
Galyl, new arsenical compound, in syphilis 580
Ganglia in wrist in rheumatism in childhood 493
Ganglionitis, acute posterior 294
Gangrene 254
— complicating general infections .. 254
— opium in 20
— surgery of 254
Garnisheeing of fees due to panel doctors 671
Gas bacillus infection 254
— in pleural cavity, method of introducing 445
Gasserian ganglion injection of alcohol in trigeminal neuralgia 377
Gastein baths, nerve-stimulating effect of 65
Gastric antiperistalsis, diagnostic value of 41
— cancer 549
— disorders, Abderhalden's dialysis test in 152
— — in angina pectoris.. 114
— — relation to spinal deformity .. 530
— — suggestion treatment in 566
— — tests of duodenal contents in .. 412
— — x-ray diagnosis of.. 40
— juice in diagnosis of cancer 180
Gastric ulcer 255
— — diagram of site of perforation .. 550
— — indications for gastro-enterostomy 551
— — pathology 255
— — relation to cancer.. 549
— — symptoms 256
— — x-ray diagnosis of.. .. 41, 258
Gastro-enterostomy for cancer 552
— indications in ulcer cases 551
Gastro-intestinal symptoms of pellagra 417, 425
— treatment of phlyctenular conjunctivitis.. 195
Gastrogenic diarrhœa 205
Gastroptosis, etiology and treatment .. 667
Gastrostomy in burns of œsophagus .. 389
— for cancer of œsophagus .. 387, 554
Gaultheria applications in rheumatoid arthritis 125
Gelatin baths in psoriasis 464
— in diet in typhoid fever 644
— injections in aneurysm 112
— pads in hæmorrhages of the newly-born.. 272
Gelatinized serum in hæmorrhagic syndrome of infectious diseases 640
General paralysis (*see* Syphilis, Cerebro-spinal) 586
— — Wassermann test in 572
— — new test of cerebrospinal fluid for 190
— — spirochæta pallida in 569
Genital complaints, vesiculotomy for .. 504
— organs, relation of pineal gland to .. 434
— — — pituitary body to 435
Genito-urinary mucous membranes, anæsthetizing effect of potassium permanganate on 22
— operations, spinal analgesia in .. 108
Gerhardt's test for acetonuria, modification of 657
Germicidal efficacy of hydrogen peroxide preparations 13
Geyser, for surgery 699
Giddiness, malingerers and 360

PAGE
Giles' operation for displaced uterus [illegible]
Gingivitis, salvarsan in .. . [illegible]
Glanders [illegible]
Glands, softening, action of carbenzyme on .. .. [illegible]
— tuberculosis, bovine and human bacilli in .. 636
— x-rays preferred to operation on [illegible]
Glandular extracts in anæmia in children [illegible]
— — Graves' disease .. .. .. [illegible]
Glandular fever .. .. . [illegible]
Glanduovin (extractum ovariale), good results of 11
Glaucoma .. .. [illegible]
Gleet, chronic, treatment .. . 270
Glioma of spinal cord .. .. .. [illegible]
Glossina, rôle in transmitting trypanosomiasis 620
Gloves, formaldehyde in sterilization of [illegible]
— sterilizing box for 718
Glucose in rectal feeding 483
— urine, test for 656
Glycerin and borax mouth applications in measles .. .. [illegible]
Glycerophosphates in fibrositis 238
— new combinations of .. .. . [illegible]
Glycogen in blood, estimation of .. [illegible]
Glycogenic function of the liver 202, 203
Glycoheptonic acid, a carbohydrate for diabetics 203
Glycosuria (*see* Diabetes Mellitus) .. [illegible]
— cataract associated with .. .. [illegible]
— increased by radio-active substances 64
— in tuberculous meningitis .. .. [illegible]
Glycyl-tryptophan test of cancer .. 180
Goitre, endemic 260
Goitre, exophthalmic 262
— — etiology and symptoms 262
— — the question of operation.. . 263
— operation for 606
— tendency to, with rheumatoid arthritis 124
Gold chloride test for albumin 189
— — — congenital syphilis 190
— combinations in tuberculosis.. .. 11
— cyanide and potassium in tuberculosis of skin 515
Gonin fumigator 698
Gonococcal infection causing pericarditis [illegible]
— lesions, value of vaccine therapy in [illegible]
Gonorrhœa 264
— in causation of iritis 306
— complement fixation test in 264
— hexal in 12
— ionic medication in 59
— keratodermia blennorrhagica following 310
— treatment 266
— vaccine therapy in 35
Gonorrhœal arthritis, treatment .. 268
— — a variety of rheumatoid 127
— infections, chronic, phylacogen treatment of 37
Gout .. .. [illegible]
— acitrin as uric acid eliminant in .. 1
— a cause of intermittent limp 122
— ionic medication in 59
— treatment by thorium-x .. . [illegible]
Gouty processes, definite action of thorium on 64
Granuloma, pupeudal 271
— telangiectodes .. .. [illegible]
Grate, adjustable.. 699
Graves' disease (*see* Goitre, Exophthalmic, and Thyroid Gland Surgery)
Grevillite folding chair .. . .. [illegible]
— glass dressing boxes .. .. .. [illegible]
Grey powder in infantile eczema . 221
— — intestinal dyspepsia in children .. [illegible]
Groos electrophone . . 695
Groves' pegs in fractures.. 247

PAGE
[illegible]
[illegible]
Guaiacol in advanced phthisis 634
— carbonate in rheumatoid arthritis .. 125
[illegible]
[illegible]
— brain, operation in 155
— carbon dioxide snow in 513
Gummatous meningitis, association with diabetes insipidus.. 200
— sporotrichosis 546
[illegible] wounds of abdomen [illegible]
[illegible] heart [illegible]
Guy's pill in heart disease 282
Gyergyai's dilator for Eustachian tube 395
[illegible]
[illegible] deficient children 17
[illegible]
Gynæcology, general review of 80

HOLLAND, C. T., 38; Hutchison, R., [illegible]
Habit-spasms, suggestion treatment for 565
Hæmacytometer, Havem-Sahli 700
[illegible]
Hæmatinic serum in anæmia in children 97
Hæmolysis in the production of infantile anæmia 96
Hæmoptysis in diagnosis of aneurysm .. 109
[illegible]
— non-tuberculous, bronchoscopy in .. 170
Hæmorrhage of the brain, operation for 158
[illegible] tion 347
— pituitrin in arrest of 23
— pulmonary, emetine in 635
— suture in control of, method.. .. 567
[illegible]
— uterine, erystypticin in 9
[illegible]
Hæmorrhages in the newly-born [illegible]
[illegible] 26, 28
— syndrome in typhoid fever 639
Hæmorrhoidal belt, new design.. .. 700
[illegible]
[illegible]
[illegible]
Hair and nails, familial dystrophy of [illegible]
[illegible]
[illegible]
[illegible]
— chlormetacresol in sterilization of .. 6
[illegible]
[illegible]
[illegible]
[illegible]
Hay fever, anovarthyroid serum in .. 3
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Heart and aorta, syphilis of [illegible]
Heart block [illegible]
[illegible]
Heart, diseases of [illegible]
[illegible]
Heart diseases and auricular fibrillation [illegible]
— — auricular flutter in [illegible]
— — in children .. [illegible]
— — diagnosis of phthisis with [illegible]
— — general review of .. [illegible]
— — methods of investigation.. [illegible]
— — pregnancy with, treatment [illegible]
— — prognosis 250
— — in relation to pregnancy .. 251
[illegible]
— — in rheumatism in childhood [illegible]
— — treatment .. 252
— failure, a terminal event of arterial hypertension [illegible]
— inflammation, otitis with [illegible]
— stimulation in croupous pneumonia.. [illegible]
— symptoms of aneurysm [illegible]
Heart, surgery of .. 256
Heat applications in fibrositis .. [illegible]
— — gonorrhœa .. 268
[illegible]
Heat exhaustion [illegible]
[illegible]
Hectine in syphilis 576, 579
Heliosite, a carbohydrate for diabetics 203
Hekalin et pepsin co., liq., hepatic stimulant [illegible]
Heliotherapy in surgical tuberculosis .. [illegible]
Helmitol, action as urinary disinfectant [illegible]
Henoch's purpura, serum treatment of [illegible]
[illegible]
[illegible] 214
— lesions, relation to spinal deformity.. [illegible]
Heredity in etiology of gastric cancer .. [illegible]
[illegible]
[illegible]
— and tuberculosis of childhood .. [illegible]
[illegible]
Hernia 290
[illegible]
[illegible] lesser sac .. [illegible]
— malingering in.. [illegible]
[illegible]
[illegible]
Herpes zoster [illegible]
[illegible] injuries [illegible]
Hetol in tuberculous iritis [illegible]
[illegible]
[illegible]
[illegible]
[illegible] 141
Hip joint, osteo-arthritis of [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] fæces in [illegible]

PAGE
Hydrocephalus, internal, operation for .. 159
Hydrochloric acid findings in gastric ulcer 257
— — gastrogenic diarrhœa 207
— — pellagra .. .. .. [illegible]
— — typhoid fever diet 645
Hydrogen peroxide in cancer of œsophagus 388
— — hypertrichosis 296
— — inflammations of the eye 233
— — preparations, germicidal efficacy of 13
Hydrolysis theory of cataract 184
Hydronephrosis, early 319
Hydropathic establishments 767
Hydrophobia (see Rabies)
Hydrotherapy in pellagra 423
— syphilis 575
— tinnitus 613
Hydrothorax complicating cardiac disease 279
Hygroma, cystic, of neck 373
— tuberculous, action of carbenzyme on 6
Hyperglobulism, produced by radio-active substances 64
Hyperidrosis, sulphur in 509
Hypernephroma, symptoms of 318
Hyperpiesis (see Blood-pressure)
Hypermetropia 484
Hypertension, arterial, *x*-ray treatment 48
Hypertensive renal disease 374
Hypertonic saline in cholera 192
Hypertrichosis 295
— *x*-ray treatment 50
Hyper- and hypopituitarism 435
Hypnotic, aleudrin as a 2
— luminal as a 16
— paracodin as a 21
Hypnotics in eczema 220
Hypnotism (*see* Suggestion) 558
Hypodermic needles and syringes, new designs 701
— syringes, improved sterilizer for .. 717
Hypophosphites contraindicated in intestinal dyspepsia in children .. 216
Hypophysin, depressor action of .. 23
Hypophysis cerebri (*see* Pituitary Body)
Hypospadias, penile, operation for .. 651
Hysterectomy with Cæsarean section .. 324
— for fibroids and cancer, comparison of results 662
— indications for 660
— vaginal clamp for 663
Hysteria, treatment by suggestion .. 564
Hysteropexy for displacement of uterus 663
Hysterotomy in pernicious vomiting .. 456

ICHTHYOL in eczema 221
— — lupus erythematosus 350
— pain in post-operative thrombophlebitis 394
— skin diseases 511
Ichthyosis (*see* Keratosis)
— ichthyol baths in 511
Ileal kink, *x*-ray diagnosis of 41
Immunization in tuberculin treatment .. 68
Impetigo contagiosa, vaccine-therapy in 511
— new method of applying sulphur in 31
Incandescent light in atonic wounds .. 55
Incarceration of colon in lesser sac .. 304
Incision of skin, spiral, for varices .. 665
Inclusion bodies in diagnosis of scarlet fever 500
Incontinence of urine in women 654
India, liver abscess in 91
Indigo carmine test of renal sufficiency .. 487
Industrial diseases and toxicology 655
Inebriates, institutions for 765
Infancy, arterial pressure in 153
— diabetes mellitus in 203
Infant, effect of antisyphilitic treatment of pregnant mother on 584

PAGE
Infant feeding .. [illegible]
— — general review of .. [illegible]
— — rules for 299
— — mortality, influence of syphilis on [illegible]
Infantile anæmia (*see* Anæmia)
Infantile diarrhœa 207
— — "cow's-milk" in .. [illegible]
— sexual trauma in production of neuroses 466
— splenomegaly, *x*-ray treatment of .. 48
Infantilism, cardiac 279
Infants, eczema in 221
— rules for artificial feeding of 299
— strangulated hernia 290
Infarction of kidney 319
Infections, acute, hæmorrhagic conditions in 639
— — heart block with 288
— bacterial of food 673
— following operations 391
— — removal of adenoids 88
— gangrene complicating 254
Infectious diseases, erythema complicating 232
— — general review of .. .. .. [illegible]
— — otitis media following 396
— — silver arsenite in .. .. .. [illegible]
Infective cholecystitis, early operation in [illegible]
Influenza bacillus, associated with ulcerative endocarditis .. .. .. [illegible]
— phthisis wrongly described as .. [illegible]
Infusion apparatus, new design .. .. [illegible]
Inguinal colostomy, dressing for .. [illegible]
Inhalation anæsthesia 102
Inhalants, formaldehyde, in lung and throat affections .. .. .. [illegible]
Inhalers, new designs of .. .. 696, [illegible]
Injection treatment in sciatica 501
Innominate artery, aneurysm of .. 112
Inoculation non-effective in prophylaxis of pneumonic plague .. .. [illegible]
Insanity .. .. [illegible]
— Abderhalden's dialysis test in 150, 152
— brain extract in .. .. .. [illegible]
Insect porters of bacterial infections .. [illegible]
Insects as carriers of kala-azar .. .. [illegible]
— in etiology of pellagra 421
Insomnia in aortic aneurysm, treatment 111
— aleudrin in 2
— from eczema 220
— during lactation, sedatives for .. [illegible]
— luminal in 16
— nervous, ureabromine in .. .. [illegible]
— paracodin in 21
— suggestion treatment in .. .. [illegible]
Institutions for inebriates .. .. [illegible]
— mental treatment .. .. .. [illegible]
— nursing 768
Instrument cases, improved pocket .. [illegible]
Instruments, appliances, etc., wanted .. [illegible]
— formaldehyde in sterilization of .. [illegible]
— improved sterilizers for 717
— new methods of sterilizing 689
Insufflation method in control of open pneumothorax .. .. .. [illegible]
Insurance Act, garnisheeing of fees due to doctors under .. .. .. [illegible]
— — legal decisions under 680
— — liability of panel doctor under .. [illegible]
— — offices, index to .. .. .. [illegible]
— relation of albuminuria to .. .. [illegible]
Intercostal nerves, avulsion for visceral crises .. .. [illegible]
Intermittent limp, causative factors of .. [illegible]
Internal organs, suggestion in functional disorders of 566
International Pneumothorax Association 445
Interscapulo-thoracic amputations .. 95
Interstitial keratitis, salvarsan in .. [illegible]
— pancreatitis, diastase in urine in .. [illegible]

PAGE
Interstitial parotitis [illegible]
Intertrigo, pellidol in 22
[illegible] in Graves' disease [illegible]
[illegible] 202
— contractions, effect of pituitary extract on .. [illegible]
— crushing clamp, new design .. [illegible]
— disinfectant, oxygen insufflation as. [illegible]
— disorders, character of fæces in 236
— — copper preparations in .. [illegible]
— — suggestion treatment in .. [illegible]
— dyspepsia of children (*see* Dyspepsia) [illegible]
— indigestion of infants, precipitated casein in .. [illegible]
— infections, colloidal silver in.. [illegible]
— [illegible] as cause of arteriosclerosis [illegible]
— lesions, relation to spinal deformity [illegible]
— obstruction, diagnosis of pancreatitis from.. [illegible]
— — by gall-stones .. [illegible]
— parasites in appendix.. [illegible]
— stasis complicating appendicitis [illegible]
— — and putrefaction in causation of diabetes, etc. 204
— — *x*-ray diagnosis of [illegible]
Intestinal surgery [illegible]
Intestinal ulceration in children [illegible]
Intestine, large, late results of short-circuiting .. [illegible]
Intestines, gunshot wounds of .. 84
— relative activity of digestion in 235
Intralaryngeal inspection, epiglottic suture for .. 329
Intramedullary tumours of spinal cord. 520
Intranasal operation for suppurative ethmoiditis.. [illegible]
Intrathoracic aneurysm (*see* Aneurysm)
Intratracheal anæsthesia.. 104
— — for spinal surgery.. [illegible]
— insufflation, apparatus for .. [illegible]
Intravenous anæsthesia .. [illegible]
Intravertebral tumours of spinal cord . 520
Intubation in inoperative cancerous stenosis of œsophagus [illegible]
[illegible] 302
— resection of part of colon for.. [illegible]
— of stomach and duodenum .. 555
Invalid lifter and support, new designs 704
Invalids, homes for 768
[illegible] preparations [illegible]
Iodide of iron in rheumatoid arthritis [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
— — congenital syphilis [illegible]
— — excretion by kidneys of [illegible]
[illegible]
— — mycetoma .. .. [illegible]
[illegible]
[illegible] 547
[illegible] 344
[illegible]
[illegible]
[illegible]
[illegible] disinfectant [illegible]
[illegible]
[illegible]
[illegible] lera .. [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Iodine, nascent, in phthisis [illegible]
— in plague .. .. [illegible]
[illegible]
— ringworm [illegible]
— simple goitre .. .. [illegible]
— tinnitus.. .. .. [illegible]
Iodipin in arteriosclerosis [illegible]
[illegible]
[illegible] a new substitute for [illegible]
Iodoglidine in arteriosclerosis .. [illegible]
Ionic medication [illegible]
[illegible]
[illegible]
— — lupus erythematosus [illegible]
— — methods of application [illegible]
— — tables of dosage in [illegible]
[illegible] through duodenal tube [illegible]
[illegible]
[illegible]
Iridin in functional derangement of the liver.. [illegible]
Iridocyclitis, guaiacol diaphoresis in .. [illegible]
Iris, ciliary body, and choroid, diseases of [illegible]
Iritis, tuberculous, hetol in [illegible]
Iron in anæmia in children [illegible]
[illegible]
— colloidal, in erysipelas and cellulitis.. [illegible]
— in eczema [illegible]
— pellagra.. [illegible]
— perchloride in ringworm [illegible]
Irrigators, improvements in [illegible]
Irritable conditions of throat, thymacetol in .. .. [illegible]
[illegible]
Isoamylamine hydrochloride, cock's-comb test of [illegible]
Isopral in intravenous anæsthesia [illegible]
[illegible]

JACKSONIAN epilepsy, operation for [illegible]
Jaundice in children [illegible]
— acute infectious [illegible]
[illegible]
— with malaria-like fever [illegible]
[illegible]
Jejunum, accessory pancreas in.. [illegible]
Jianu's operation in œsophageal cancer [illegible]
[illegible] effect of .. [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

KALA-AZAR [illegible]
[illegible]
[illegible] 14
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Keratodermia blennorrhagica [illegible]
Keratosis follicularis [illegible]
[illegible]
[illegible]

PAGE
Kerion, ichthyol in 511
Kernig's sign in cerebrospinal fever .. 156
Kerol, a diphenyl derivative, as intestinal antiseptic .. .. .. [illegible]
Khartoum, anti-malarial work at .. 352
Kidney, acute hæmatogenous infection of 319
— calculi in 314
— congenital anomalies of 311
— decapsulation in eclampsia 457
— disease, Abderhalden's dialysis test in 150
— — chemistry of blood in 149
— — *x*-ray diagnosis of 44
— dumb-bell 313
— effect of salvarsan on 27
— efficiency tests (*see* Renal Efficiency) 455
— gun-shot wounds of 85
— horseshoe 312
— incision for suppression of urine in black-water fever 130
— lesions, relation to spinal deformity 530
— movable 313
— — operations for 313
— post-operative infection of 321
— pseudo-calculus of 44
— relation to senile cataract 185
— removal of, for pyelitis in childhood .. 474
— results of operations on 319
Kidney, surgery of 311
— suture of 320
— tuberculosis of 317
— — dysuria in 145
— tumours of 318
Killian's suspension laryngoscopy .. 328
Knee, injuries to 321
— jerks in cerebrospinal syphilis .. 587
— joints, œdema of, in rheumatoid arthritis 124
Knife, Bruning's guarded 705
Kobelt's electric bougies in gonorrhœa .. 205
Kopetzky's test in prognosis of meningitis 404
Kraske's operation for cancer of rectum 451
Kreuznach baths, nerve-stimulating effect of 65

LANGMEAD, F., 93, 207, 214, 228, 272, 277, 305, 308, 394, 414, 433, 459, 474, 481, 502, 507, 619, 623, 648; Leech, P., 94, 112, 119, 169, 171, 223, 242, 254, 286, 294, 322, 344, 373, 391, 428, 496, 517, 527, 541, 567, 605, 614, 630, 695; Little, E. G., 85, 86, 89, 119, 174, 220, 231, 232, 254, 274, 294, 295, 319, 340, 341, 349, 399, 415, 427, 464, 495, 496, 503, 507, 515, 647, 659
Laboratory tests of pregnancy 453
Labour 323
— obstructed 324
— ovarian tumours complicating .. 409
— sequelæ of 323
Labyrinthine disease and vertigo .. 606
Labyrinthitis 325
Lacrymal apparatus, diseases of 327
— secretion as test in anæsthesia .. 106
Lactation, difficulties in commencement of 297
Lactagol for nursing mothers 7
Lacteol, a new lactic ferment 729
Lactic acid in diabetes 204
— — infantile diarrhœa 208
Lacto-bacillin in infantile eczema .. 221
Lacto-vegetarian diet in angina pectoris 114
Lactose, excretion by kidneys of .. 487
Lagophthalmus complicating leprosy .. 334
Lamblia intestinalis as cause of dysentery 213
Lamps, electric head, new designs 705, 706
Land unfenced, legal decision re 684
Lane's ileal kink, *x*-ray diagnosis of .. 41

PAGE
Lane's plates in fractures 246
— — instrument for use in adjusting [illegible]
Lange's test in cerebrospinal fluid .. 185
— — syphilis .. .. .. [illegible]
Laryngeal affections, formaldehyde inhalants in 728
— inspection, epiglottic suture for .. [illegible]
— nerve paralysis from goitre 606
— — superior, division in laryngeal tuberculosis 331
— paralysis 331
— symptoms of aneurysm .. 109, 110
— tuberculosis, artificial pneumothorax in 448
Laryngitis stridulosa, diagnosis from asthma .. .. [illegible]
Laryngoscopic apparatus, improvements in 706
Laryngoscopy, suspension 328
Larynx 328
— cancer of 329
— radiography of 328
— salvarsan in ulcerations of .. 384
Lasophos, a new nerve tonic .. 726
Lassar's paste in lupus erythematosus .. 350
Lateral sinus thrombosis 407
Lavage in congenital pyloric stenosis .. 475
Laxatives in angina pectoris 114
Lavatory disinfection, apparatus for .. 712
Lead colic, bradycardia with 279
— in eczema 220
— lotion in psoriasis 465
— poisoning by diachylon 685
Leather-bottle stomach 556
Leeches for stout bronchitics 166
Leg bones, fractures of 245
— cradle, new design 706
Legal decisions 677
Legal's test for acetonuria, modification of 657
Leishmaniasis 331
— failure of *x*-ray treatment in 48
Lens (*see* Cataract) 183
Lenigallol in eczema 220
Leprolin injections in leprosy 334
Leprosy, bacteriology and treatment 333
— bacillus, action of radium on .. 53
— surgery of 334
— universal segregation advised .. 334
Leptynol for reducing adiposity 15
Lerche's œsophagometer in cardiospasm 390
Leucocyte count in otitis media 396
— — effect of radio-active substances on 64
— extract in erysipelas 15
Leucocytes, effect of tuberculin on .. 75
Leucocytosis in acute parotitis 415
— dengue 179
— herpes zoster 294
— not always present in leukæmia .. 336
— in relation to typhoid fever 641
— tuberculosis 623
Leucocytozoon syphilis 569
Leukæmia 334
— analogy of polycythæmia to 453
— diagnosis 335
— experimental 334
— myeloid, *x*-ray treatment of 47
— nodular 336
— treatment 337
— thorium-*x* in 67
— without leucocytosis 336
Leukæmic eruptions of the skin 349
Lewisohn's telescopic œsophagoscope .. 171
Libido, sexual, in production of neuroses 466
Lice in etiology of relapsing fever .. 342
Lichen planus, human blood injections in 512
Lientery of children, opium for .. .. [illegible]
Life insurance offices, index to .. .. [illegible]
— — relation of albuminuria to .. 88
Ligaments of knee, rupture of 321
Ligature cases and bottles, new designs 707

PAGE
Light in etiology of pellagra [illegible]
— treatment [illegible]
Lightning pains relieved by salvarsan .. [illegible]
Ligneous phlegmon of abdominal wall .. [illegible]
Linitis plastica (see Stomach, Fibromatosis of) .. .. [illegible]
Linseed baths in pemphigus foliaceus .. [illegible]
Lipase in duodenal contents in pancreatic [illegible] [illegible]
Lipodystrophia progressiva [illegible]
Lips, seborrhœic keratosis of .. 341
Liq. ferri perchlor. in ringworm .. 498
Liquorice powder in arteriosclerosis [illegible]
Lithotomy, indications for [illegible]
Lithotrity the operation of choice in Egypt [illegible]
Litholapaxy, advantages of [illegible]
Lime salts in oxalic acid poisoning [illegible]
Liver, abscess of (*see* Amœbiasis) .. [illegible]
— conditions causing intestinal dyspepsia in children 214
Liver, cirrhosis of .. 341
— — [illegible] [illegible]
— — simulating splenic anæmia 545
Liver, cysts of [illegible]
— lesions, relation to spinal deformity .. [illegible]
— — *x*-ray diagnosis of .. [illegible]
Liver, functional derangement [illegible]
Liver, functional efficiency, tests for .. .. [illegible]
— gunshot wounds of .. [illegible]
— relation to diabetes mellitus .. [illegible]
Liver, syphilis of .. [illegible]
Lobelia in asthma of children .. [illegible]
Local anæsthesia in sciatica [illegible]
— and regional anæsthesia [illegible]
Locomotor ataxia (see Syphilis, Cerebro-spinal)
— — aleudrin in pains of [illegible]
Lourdes cures, auto-suggestion and 562
[illegible] syphilis [illegible]
Luetin reaction in diagnosis of syphilis [illegible]
Lumbago (*see* Fibrositis) .. [illegible]
Lumbar puncture in enuresis [illegible]
— — otitic meningitis 404, 405
— — [illegible] [illegible]
— — traumatic epilepsy [illegible]
Luminal as a sedative and hypnotic 16
Luminotherapy in atonic wounds, etc... 55
Lung, abscess of .. [illegible]
— [illegible] [illegible]
— conditions, obscure, *x*-ray diagnosis in [illegible]
— foreign bodies in 347
— [illegible] fever [illegible]
— [illegible] [illegible]
— inflammation of, otitis with .. [illegible]
— [illegible] 347
— lesions from umbilical infections 648
— [illegible] [illegible]
— penetrating wounds of, treatment .. [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
Lung, surgery of .. 344
[illegible] [illegible]
Lupus erythematosus .. [illegible]
— — [illegible] [illegible]
— — [illegible] [illegible]
— — [illegible] [illegible]
— Finsen light in .. 54
— [illegible] lin in [illegible]
— ionic medication in .. [illegible]
— [illegible] [illegible]
— nasi, nascent iodine in [illegible]
— vulgaris, carbon dioxide freezing in . [illegible]

Lupus vulgaris, vaccine-therapy in [illegible]
Lympangioplasty in elephantiasis [illegible]
Lymphatic gland extract in adenoid cases [illegible]
— — [illegible] enlarged tonsils .. .. .. [illegible]
Lymphatic glands enlarged, with rheumatoid arthritis [illegible]
— — site of primary lesion in tuberculosis of childhood [illegible]
— and [illegible] inter-relationship .. [illegible]
Lymphocytes, to distinguish from myeloblasts [illegible]
Lymphocytosis in acute parotitis [illegible]
— [illegible] [illegible]
[illegible] 53

M[illegible]

[illegible] on .. 435
Magnesium carbonate in lupus erythematosus [illegible]
— sulphate in flagellate dysentery [illegible]
— — [illegible] [illegible]
— — in tetanus 599 604
Magnifier, "third hand" [illegible]
Maize diet in etiology of pellagra [illegible]
Malaria .. [illegible]
— with marked jaundice [illegible]
— pernicious .. . [illegible]
Malarial anæmia [illegible]
— parasite, cultivation of 351
[illegible] methods in [illegible]
— — colloidal copper in 7
— — [illegible] [illegible]
— — [illegible] [illegible]
Malingering 353
— conduct of medical witness in court [illegible]
— [illegible] 357
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— necessity for detection of [illegible]
— [illegible]
— in skin disease .. [illegible]
— [illegible] [illegible]
Malnutrition in children, massage in [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
[illegible] [illegible]
— [illegible] [illegible]
Malta Fever 361
[illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]
[illegible] disease . .. . [illegible]
[illegible] [illegible]
[illegible] [illegible]
— [illegible] [illegible]
[illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]

PAGE
Massage in fibrositis .. 240
— gonorrhœal arthritis .. 268
— Graves' disease .. 264
— and movement in fractures .. 240
— in rheumatoid arthritis .. 128
— therapeutic indications for 16
— in tinnitus 613
Mastoid disease (see Otitis Media)
— operation, after-treatment 402
— — in children.. 401
— — for labyrinthitis 320
— — persistent otorrhœa of children .. 397
— — skin grafting after 402
Mastoiditis 402
Masturbation in etiology of orchitis in children 394
Materia medica, dictionary of 1
Measles 363
— erythema complicating 232
— leucocyte count in diagnosis from rubella 408
— otitis in 396
Meat, underdone, in Graves' disease .. 264
— unsound, decision re warranty of .. 684
Mechanical measures in bronchitis in children 104
Meckel's diverticulum, surgical aspects of 302
Mediastinal pressure, early diagnosis of.. 364
Mediastinal tumours 364
Medical gymnastics for mentally-deficient children 17
— institutions, homes, spas, etc. .. 752
— officers of schools, legal decisions re.. 682
— official and trade directory 776
— and scientific periodicals, etc. .. 780
— scientific societies 779
— and surgical appliances 689
— — progress, review of 77
Medico-legal and forensic medicine 670
Mediterranean, form of anæmia endemic on shores of 96
Melæna neonatorum 272
Melanotic tumours, primary, of rectum 482
Membranes, pericolic 430
Menopause, artificial, ovarian grafting for 365
— disturbed or artificial, glanduovin in 11
— sumbul of no value at 31
Menorrhagia, erystypticin in 9
— synthetic hydrastinin in 13
Meningitis, epidemic (*see* Cerebrospinal Fever 180
— gummatous, association with diabetes insipidus 200
— otitic 404
— — see Otitis Media 395
— — operation in prophylaxis of .. 406
— — results of operation 405
— after removal of adenoids 88
— in syphilitic children 218
Meningitis, tuberculous 365
Menstrual bleeding, excessive, erystypticin in 9
Menstrual disorders 365
Menstruation, casts passed in .. 365
— excessive, synthetic hydrastinin in.. 13
Mensuration in diagnosis of pregnancy 455
Mental cases, luminal as sedative in .. 16
— complaints, seminal vesiculectomy in 504
— defects and enuresis 228
— — relation to congenital syphilis .. 598
— — and syphilis 590
Mental diseases 366
— — Abderhalden's test in 152
— — hypnotism in 564
— excitement, aleudrin in 3
— powers, pineal gland extract in stimulation of 434
— symptoms in cerebrospinal syphilis.. 586
PAGE
Mental symptoms in pellagra .. 427, 428
— treatment, institutions for .. 752
Mentally defective children, legal decision re 682
— — — medical gymnastics for .. 17
Menthol, camphor, and chloral in fibrositis 238
Merck's fuchsine medicinal in chronic ulcers 647
Mercurial stomatitis, salvarsan in .. 27
Mercuric soap, "aseptoid" 725
Mercury (*see* Syphilis) 574
— arsenic paste in cancer 178
— in cerebrospinal syphilis 591
— colloid, in furunculosis 254
— congenital syphilis 581
— endemic anæmia of children.. .. 97
— in heart disease 282
— injections in microbial infections .. 18
— — simple solitary ulcer of bladder.. 147
— in intestinal dyspepsia of children .. 216
— iodide in lupus erythematosus .. 350
— lotions in otitis media 399
— ointment in eczema 221
— in pellagra 427
— perchloride lotion in cataract operations 183
— in phlyctenular conjunctivitis .. 185
— psoriasis 464
— pyelitis of children 472
— and salvarsan combined treatment .. 574
— for stout bronchitics 166
— in syphilis of the liver.. 344
— syphilitic arthritis 128
— — heart disease 277
— yellow oxide, new preparation of .. 722
Mercury-sulfamino-dimethyl-phenyl pyrazolon in syphilis 578
Mesbé, a new remedy for tuberculosis .. 18
Mesentery, swellings arising in 368
Mesothorium in skin diseases 514
— (*see* Thorium), nature and properties 60
Metabolic disorders, silver arsenite in .. 4
Metabolism, carbohydrate, factors influencing 201
Metallic antimony in sleeping sickness.. 621
Metals, curative action on carcinomata of 18
Metastatic nodules with Bence-Jones proteinuria.. 464
Methylene blue in tuberculosis in childhood 628
Mett's tubes for test for protease .. 411
Michel's sutures, new forceps for clamping 698
Microbes, distribution in intestine .. 236
Microbial infections, mercury injections in 18
Micrococcus catarrhalis, differentiation from gonococcus 266
— tetragenus, causing disease simulating acute phthisis 505
— zymogenes, association with ulcerative endocarditis 225
Micrometer eyepiece, "step" 708
Micro-organisms causing goitre 261
Microscopes, improvements in 708
Microtia, congenital bilateral 216
Micturition, painful, in women 145
Middle-ear deafness as cause of vertigo 666
— disease (*see* Otitis Media) 395
— disease, excretion of urotropin in pus in 13
— inflammation, diagnosis of 217
— syphilis of 219
Milk adulteration, legal decision re .. 677
— diet in cirrhosis of the liver 341
— — sprue 347
— — typhoid fever, insufficiency of 643, 644
— in etiology of surgical tuberculosis .. 636
— flow, cotton-seed extract inducing .. 7
— pancreatized, in rectal feeding .. 483
— relative value of boiled and unboiled 299

PAGE
[illegible]
[illegible]
— whole citrated, in infant feeding .. 300
[illegible]
[illegible]
[illegible]
Miscarriages caused by diachylon .. 685
[illegible]
[illegible]
Monilia fungi, relation to sprue 547
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Morphinism, suggestion treatment of .. 565
Mosquito-proof house for tropics .. 351
[illegible]
[illegible]
Motor cars, legal decisions re 680
[illegible]
[illegible] adenoids [illegible]
Movable kidney, operations for 313
Movements and massage in fractures .. 246
— passive, in gonorrhœal arthritis .. 268
Mucous colitis in children 214
— membranes, anæsthetizing effect of potassium permanganate on .. 22
[illegible]
Mumps [illegible]
— relation to acute interstitial parotitis 415
[illegible] rheumatic affections 66
Muscle fibres, intestinal digestion of .. 235
[illegible]
[illegible]
— — with sporotrichosis 546
[illegible]
— sclerosis in ischæmic myositis .. 370
[illegible]
Mutism, hysterical, suggestion treatment [illegible]
Mycetoma 360
Mycosis fungoides [illegible]
[illegible]
[illegible]
[illegible]
Myelomata, multiple, with proteinuria .. 464
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Myositis, ischæmic [illegible]
[illegible]

N[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Nasal accessory sinuses [illegible]
[illegible] adenoids 88
[illegible]
[illegible]

PAGE
[illegible]
— duct obstruction, operative technique [illegible]
[illegible]
[illegible] hæmorrhage after.. 23
[illegible] in childhood 494
— punches, etc., universal handle for .. 700
[illegible]
— work, noviform in 19
Nascent iodine in phthisis 635
Nasopharyngeal fibroma, operation for 382
[illegible] syphilis of 385
National Insurance Act, garnisheeing for fees due to doctors under.. .. 671
[illegible]
— — — [illegible]
— — — and malingering 354
Nauseant effect of digitalis bodies .. 8
[illegible]
Neck, cystic hygroma of 373
Neckband, tight, in relieving tinnitus .. 613
[illegible]
Necrosis of tissue, action of carbenzyme on 6
Necrotic changes, thorium causing .. 64
[illegible]
— in aural syphilis 219
— benign tertian malaria 353
[illegible]
— in interstitial keratitis 198
— powder for chronic ulcers 515
[illegible]
— treatment of pregnant women .. 585
[illegible]
— for pyelitis in childhood 474
Nephritis 373
[illegible]
[illegible]
[illegible]
— protein-free diet in 375
[illegible]
— squill as a diuretic in 30
[illegible]
[illegible]
[illegible] for 315, 316
[illegible]
[illegible]
[illegible]
[illegible]
Nerve blocking, or regional anæsthesia . [illegible]
— diseases, suitable or not for hypnotic [illegible] 564
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

PAGE
Nervous symptoms of rheumatism in childhood 493
— stimulating effect of thorium-x on [illegible]
Nesfield's dislocation in cataract operation [illegible]
Neubornyval in nervous conditions .. 19
Neumann "noise apparatus" in labyrinthitis 326
Neuralgia, aleudrin in 3
— after herpes zoster, ionic medication in 294
— high-frequency currents in 55
— ionic medication in .. .. . [illegible]
Neuralgia, trigeminal 377
Neurasthenia, traumatic 379
— sumbul of no value in 31
— traumatic, malingerers and 360
Neuritis, retrobulbar, guaiacol diaphoresis in 234
Neuro-recurrences after salvarsan treatment . .. .. 574, [illegible]
Neuroses, functional, malingerers and .. 360
— sexual trauma in production of 466, 563
New tuberculin 71
Newly-born, hæmorrhages in 272
— prophylaxis against ophthalmia in .. 196
— umbilical infections in 648
Nigeria, prevalence of hookworm disease in 650
Night terrors, belladonna and potassium bromide in 229
Nikolsky's sign in pemphigus foliaceus .. 428
Ninhydrin in test for pregnancy 454
Nipples, cracked 297
Nitrogen retention, estimation of .. 488
— in urine, tests for 657
Nitrous oxide anæsthesia in major surgery 102
Nodular leukæmia 336
Nodules, metastatic, with Bence-Jones proteinuria 464
— subcutaneous, of calcium 174
Noguchi's luetin test in syphilis .. 570
— test for albumin in cerebrospinal fluid 189
— rabies virus 476
Noises in the ear (*see* Tinnitus) 612
Nonne's tests for albumin in cerebrospinal fluid 189
Nose 380
— deformities of 381
— influence on temperature of inspired air 381
— lupus of, nascent iodine in 382
— malignant disease of 382
— plastic surgery of 496
— and throat diseases, review of .. 82
Nose and throat, general therapeutics of .. .. .. [illegible]
Notes 787
Noviform, a new substitute for iodoform 19
Novocain anæsthesia in spinal surgery .. 524
— with general anæsthetic in major surgery 104
— injections in sacral canal in sciatica .. 501
— local anæsthesia in lung surgery .. 346
Nurses, addresses of 793
Nursing institutions and homes 768
Nux vomica in fibrositis 238
— — intestinal dyspepsia of children .. 216
Nystagmus with labyrinthitis 326
— miners', causes and symptoms .. 685

OATMEAL cure in diabetes 202
O'Beirne's valve in diagnosis of appendicitis 117
Obesity, adjuvant effect of thorium-*x* in 66
— in angina pectoris, treatment .. 114
— leptynol for 15
— treatment of bronchitis in 156
Obstetrics, general review of 60
Occupation incidence of pellagra .. 419
— neuroses, suggestion treatment and 565
— in spinal curvature 540
PAGE
Occupational brass-poisoning . [illegible]
— eczema .. . .. [illegible]
Ocular muscles, disorders of (*see* Strabismus) . . [illegible]
Œdema of heart failure, squill in [illegible]
— knee joints in rheumatoid arthritis. [illegible]
— sub-glottic, post-bronchoscopic . [illegible]
Œsophageal affections, x-ray diagnosis of [illegible]
— cancer, gastrostomy for .. [illegible]
— — radium and x-rays in .. . 46
— cancerous stenosis, intubation in [illegible]
— lesions, examination of . .. [illegible]
Œsophagometer for measuring dilated œsophagus .. .. .. [illegible]
Œsophagoscope, Lewisohn's telescopic [illegible]
Œsophagoscopy in diagnosis of cancer [illegible]
— in diagnosis of cardiospasm . [illegible]
— for foreign bodies .. .. . [illegible]
Œsophagus .. .. [illegible]
— cardiospasm with sacculation of .. [illegible]
— cicatricial stricture of 388
— diphtheria of 209
— malignant disease of 385
— peptic ulcer of 390
— syphilis of .. .. [illegible]
Offensive trades, legal decision re .. [illegible]
Official and trade directory . 776
Oil injections for ureteral calculus . [illegible]
— inunction in multiple subcutaneous calcinosis .. .. [illegible]
— in treatment of spinal curvature .. [illegible]
Ointments in pellagra .. .. . [illegible]
Olive oil in cancer of œsophagus .. 388
— — typhoid fever .. .. . [illegible]
Omental cuff in treatment of gastric ulcer [illegible]
Omentum, importance in promoting peritoneal adhesions .. .. [illegible]
Omnopon, all the alkaloids of opium [illegible]
Open-air treatment of stout bronchitics [illegible]
— — surgical tuberculosis .. .. [illegible]
Operating tables, new designs .. .. [illegible]
Operation in Graves' disease .. .. [illegible]
— nasal, effect on asthma .. .. [illegible]
— wounds, iodine as sole dressing to clean [illegible]
Operations on anæmic subjects .. .. [illegible]
— complications following .. . [illegible]
— on diabetes 205
— on nose, etc., pituitrin in lessening hæmorrhage after .. .. .. [illegible]
— noviform in .. .. [illegible]
Operative findings in gastric ulcer . [illegible]
— and non-operative treatment of fractures 242
Ophthalmia neonatorum, incidence of .. [illegible]
— — ionic medication in .. .. [illegible]
— sympathetic, guaiacol diaphoresis in [illegible]
Ophthalmic work, noviform in .. .. [illegible]
Ophthalmology, general review of .. [illegible]
Ophthalmoscope in diagnosis of sinus thrombosis .. .. [illegible]
Opium alkaloids, indications for omnopon [illegible]
— in cancer of prostate 462
— congenital pyloric stenosis .. [illegible]
— gangrene 20
— heart disease 282
— intestinal dyspepsia of children . [illegible]
— lientery in children .. .. [illegible]
Opsonic index in phlyctenular conjunctivitis .. .. [illegible]
— — plague 440
— — and tuberculin dosage .. [illegible]
— — in tuberculosis, use of .. . [illegible]
Optic atrophy, association with diabetes insipidus 200
Oral sepsis, association with ulcerative endocarditis 227
— — in etiology of gastric cancer . 549
Orchitis, acute primary .. .. [illegible]
Organotherapy in skin diseases .. .. [illegible]

PAGE
Oriental sore (see Leishmaniasis) [illegible]
Ornithodorus moubata in etiology of relapsing fever [illegible]
Orpiment in hypertrichosis 295
[illegible] 7[illegible]
Osler's disease 453
Osteitis, early diagnosis of . 4[illegible]
Osteo-arthritis of hip joint 294
— malingerers and 357
Osteomalacia, anovarthyroid serum in 3
Osteomyelitis, acute, serum treatment of 2[illegible]
— — vaccine therapy in 36
— following removal of adenoids .. 88
— from nasal sinus suppuration .. 371
Osteoporosis, blue sclerotics associated with . . . [illegible]
Otitic meningitis 404
— — results of operation 405
Otitis, exanthematic 396
Otitis media 395
— — [illegible] 1[illegible]
— — chronic non-purulent . . [illegible]
— — pain in diagnosis of 217
— — prognosis 398
— — technique of hearing tests in .. 398
— — treatment 399
Otorrhœa, persistent, in children, following infections 397
Otosclerosis, brilliant results with radium 409
Ova, effect of thorium on 63
— method of demonstrating in fæces [illegible]
Ovarian lesions, relation to spinal [illegible] . [illegible]
Ovarian tumours . 4[illegible]
— grafting in artificial menopause .. 365
— preparations, subcutaneous administration of 11
Ovaries, effect of filtered x-rays on .. 45
Ovariotomy for tumours during pregnancy 409
Ovary, acute enlargement, following mumps 369
Oxalic acid poisoning, lime salts in .. 20
[illegible] 71[illegible]
[illegible] pneumonia 41[illegible]
— injection to avoid danger in aspirating pleural cavity 354
— insufflation as an intestinal disinfectant 20
— with nitrous oxide in major surgery 102
— in pregnancy [illegible] 4[illegible]
— for stout bronchitics 166
Oxy-protein-acid-nitrogen in urine .. 657
Ozæna 41[illegible]
— ionic medication in 59
— vaccines in 384
Ozoline antiseptic and deodorant .. 730
Ozone, little value as a gaseous disinfectant . . [illegible]

PACKARD, F. R., [illegible]

Packs, warm, in chorea 495
[illegible]
[illegible] 1[illegible]
[illegible] 4[illegible]
Pancreas, functional activity of 410
Pancreas, laboratory diagnosis of diseases of 411
[illegible]
Pancreas, surgery of 412
[illegible]
[illegible]
[illegible]

Pancreatic inadequacy in children .. 215
Pancreatin in pernicious anæmia .. 101
Pancreatitis, abscess of lesser sac following . . 412
Pancreatitis acute . 41[illegible]
— chronic, amyl butyrate-ferment test in [illegible]
Pancreatized milk in rectal feeding . .. 483
Panhysterectomy, indications for .. 660
— vaginal clamp for 693
[illegible] 7[illegible]
Papillœdema, guaiacol diaphoresis in .. 234
Papilloma of bladder, high-frequency current in 141
Paracentesis in aural syphilis 219
— danger of 345
— in hydrothorax 279
— pericarditis, technique 430
Paracodin, a new codeia preparation .. 730
— as a sedative and hypnotic 21
Paraffin in arteriosclerosis 122
— injections in ozæna 410
— for stout bronchitics 166
Paraldehyde in intravenous anæsthesia 107
Paralysis, anæsthesia 107
— of bladder, nerve-root anastomosis for 527
— epidemic poliomyelitis 451
— general (see Syphilis, Cerebrospinal) [illegible]
— laryngeal [illegible]
— post-operative intestinal, effect of pituitary extract on 23
— of recurrent nerve, bronchoscopy in 170
— — [illegible]
— — muscles, caused by magnesium salts 600
Paralytic phenomena, hysterical, suggestion treatment in 565
Paraplegia, spinal tumours in etiology of 519
— in thoracic aneurysm 109
Parasites causing appendicitis 116
Parasitic infections, new method of applying sulphur in [illegible]
— [illegible]
[illegible]
[illegible]
[illegible]
Parasitology of blackwater fever .. 139
Parasyphilis, luetin reaction in 571
[illegible]
[illegible]
Paratyphoid fever 414
[illegible]
Paretic muscles, exercises for 17
[illegible]
[illegible]
Parotitis [illegible] 4[illegible]
[illegible]
Parturition, management of dystopic [illegible]
[illegible]
Pasteurization of milk, advantages of .. 299
[illegible]
Pediculosis capitis [illegible]
[illegible] citis 115
Pellagra [illegible]
— [illegible] 417, 4[illegible]
— etiology 418, 424
— [illegible]
— [illegible]
— [illegible]
— [illegible]
[illegible]
— [illegible]
Pemphigus [illegible]
— [illegible]
— [illegible]

PAGE
Penile hypospadias, operation for . 651
Penis, bone formation in 428
Penis, surgery of 428
— tuberculosis of.. 428
Pennyroyal, oil of, small emmenagogue value of 9
Peptic ulcer of œsophagus 390
Peptone in rectal feeding.. 483
Perchloride of iron in ringworm.. .. 498
— mercury lotion in cataract operations 183
— — in microbial infections 18
Percussion in diagnosis of tuberculous bronchial glands 103
— — typhoid fever 640
— fractures 244
Perez's bacillus and ozæna 410
Pericardial effusions, drainage of .. 421
— — x-ray diagnosis of.. 43
Pericarditis 429
Pericolic membranes 430
Perineal prostatectomy, urinary fistulæ after.. 652
— — Wilms' method of.. 460
Periodicals medical and scientific .. 780
Peripheral circulation, stasis of 548
Perisplenitis with splenomegaly.. .. 545
Peritoneal adhesions, methods of promoting 432
Peritonitis 432
— excretion of urotropin in pus in .. 13
— sea water in 27
Permanganate of potassium, anæsthetizing effect on mucous membranes 22
— — in gonorrhœa 267
— — poisoning amongst workers in .. 687
— — in snake-bite 515
Permanganates in cholera 192
Pernicious anæmia 98
— — causes in children.. 66
— — relation to bone-marrow cancer.. 98
— — salvarsan in 99
— — splenectomy for 546
— — thorium-x in 66, 100
— malaria 353
Perogen salt baths 730
Peroxide of hydrogen in cancer of œsophagus 388
— — germicidal efficacy of preparations of 13
— — in inflammations of the eye .. 233
Peroxides in hypertrichosis 296
Persuasion method of treatment .. 562
Pertussis 433
Petroleum in spinal curvature 540
Petronol, a new paraffin preparation .. 730
Petruschky's tuberculin ointment .. 73
Pharyngeal insufflation anæsthesia .. 106
Pharynx, salvarsan in ulcerations of .. 384
Phenacetin for headache during lactation 298
Phenazone in asthma of children .. 130
Phenol (*see* Carbolic Acid) 604
Phenolphthalein in infantile eczema .. 221
Phenosulphonephthalein test of renal activity 485
Phimosis as cause of enuresis .. . 225
Phlebotomus fever (*see* Sand-fly Fever)
Phlegmon, ligneus, of abdominal wall .. 85
Phloroglucin test in urinary infections 655
Phlyctenular conjunctivitis 194
Phobrol (chlormetacresol) as an antiseptic 6
Phosphoric acid in pyelitis of children .. 474
Phrenocardia, a cardiac neurosis .. 278
Phthalein test of renal activity 485
Phthisis (*see* Tuberculosis)
— simulated by actinomycosis 86
— value of x-ray findings in 42
Phylacogen injections in rheumatoid arthritis 127
— treatment of rheumatism 37
Phylacogens, varieties and uses of .. 730
Physostigmine, effect on paroxysmal tachycardia.. 285
Picric acid and camphor in ringworm .. 497
— — for wounds.. 22
Picrotoxin in Graves' disease 264
Pigmented areas, sulphur for 510
Pigments in urine, tests for 658
Piles (*see* Hæmorrhoids)
Pilocarpine in labyrinthine vertigo .. 666
— tinnitus.. 613
Pineal extracts, physiological action of 435
Pineal gland, functions of 434
Pini sed., a new antipruritic ointment .. 731
Piperonal, preparation of, hydrastinin from 13
Pituglandol, rupture of uterus after .. 22
Pituitary body, diseases of .. 435
— — relation to diabetes insipidus .. 200
— — — — mellitus 201
— — — thyroid 515
— extract in Graves' disease 264
— — physiological action of 435
— — in pneumonia 443
— — therapeutic indications and effects 22
— and pineal gland defects, comparison of 434
Pituitrin and adrenalin, good results of combining 24
— in cholera 193
Pityriasis simplex of scalp, sulphur in .. 510
Plague 437
— mode of infection 438
— report of English Commission on .. 439
— treatment 440
Plant growths, effect of thorium on .. 63
Plant-Vincent angina, salvarsan in 27, 385
Plaster, adhesive, as direct dressing for wounds 514
— spica in fracture of neck of femur .. 250
Pleural effusion 441
— significance of, in diagnosis of tuberculosis.. 633
— tuberculous, injections of infusion in 441
Plumbism and the sale of diachylon .. 685
Pneumococcal arthritis, vaccine therapy in 36
— infection in otitis media 395
Pneumococci, specific action of camphor against 6
Pneumonia 442
— as an accident.. 671
— colloidal silver in 20
Pneumonia, epidemic 443
— gangrene complicating 254
— and heart block 288
— post-operative 302
— vaccine therapy not serviceable in .. 30
Pneumonic plague 437
Pneumosan, a new remedy for tuberculosis.. 731
Pneumothorax, artificial .. 445
— — apparatus for 711
— — selection of cases 449
— — mechanical control of 346
— — technique of 445
Pneumotomy for shawl pin in lung .. 348
— transpleural, for foreign body in lung 347
Podophyllin in functional derangement of the liver 343
Poisoning of food, bacterial 673
— by food, uzara in diarrhœa of .. 33
— manganese, symptoms and treatment 687
— salvarsan 594
Poisons, non-corrosive, action of adrenalin on 2
Polioencephalitis, massage in the spastic contractions of 16
Poliomyelitis, acute parotitis with .. 415
Poliomyelitis, epidemic 450

PAGE
Pollen extract in hay fever .. 4, 394
Polycythæmia 452
Pollactol, a new galactagogue .. 731
Polyneuritis, rice diet and 134
Polypi of the ear 216
— aural and post-nasal, a cause of cough 170
Polyuria, effect of pituitary gland on .. 435
— induced by pituitary extract .. 200
Porta's method of suturing blood-vessels 120
Portal infection, urotropin in 12
Porto Rico, prevalence of hookworm disease in 649
Port-wine stain, radiotherapy in .. 52
Position, change of, in bronchitis of children 164
— — in croupous pneumonia 442
Post-mortem examination, legal decisions re 672
Post-nasal polypus a cause of cough .. 170
Post-operative complications 501
— intestinal stasis complicating appendicitis 110
— prophylaxis in breast cancer, x-rays in 46
— tympanites, urotropin in 12
Post-partum retroversion, cause and treatment 324
Posture, characteristic, in thoracic aneurysm 109
Potassium bicarbonate in pyelitis of children 474
— bromide in enuresis 229
— citrate in enuresis 228
— — pyelitis of children .. 472, 474
— — cholera 194
— and gold cyanide in syphilis 581
— — — tuberculosis of skin 515
— iodide in angina pectoris 114
— — aortic aneurysm .. 111
— — arteriosclerotic vertigo 666
— — asthma of children 130
— — congenital syphilis 582
— — excretion by kidneys of 487
— — in fibrositis 238
— — ionization with 56
— — in mycetoma .. [illegible]
— — liniment in rheumatoid arthritis 12[illegible]
— — in psoriasis 464
— — sporotrichosis .. 547
— — syphilis of the liver 344
— — syphilitic arthritis 128
— — — heart disease .. 277
— permanganate, anæsthetizing effect on mucous membranes 22
— — baths in psoriasis 465
— — in gonorrhœa 267
— — [illegible] amongst workers in [illegible]
— — snake-bite 518
— sulphuratum, method of applying to skin 30
Potency, effect of radio-active substances on 65
Pott's disease, diagnosis of osteomyelitis from 541
— [illegible] of vertebral [illegible] from 520
— [illegible] [illegible]
Pregnancy, cystitis of 145
— [illegible] in [illegible]
Pregnancy, diagnosis of .. 453
— [illegible] in [illegible]
Pregnancy, ectopic 455
— [illegible] test of Abderhalden in [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— ovarian tumours complicating .. 409
Pregnancy, toxæmias of [illegible]
— treatment of [illegible] in [illegible]

PAGE
Pregnancy, vomiting of 456
Presbyopia 484
Pressure, mediastinal, early diagnosis of 364
Primary melanotic tumours of rectum 482
Pringle's operation for umbilical hernia 291
Prisms, prescription of 558
Probe, tonsil, new design .. 721
Progress of pharmacy, dietetics, etc. 724
Prolapse of uterus, operation for .. 663
[illegible], a new local anæsthetic [illegible]
Proprietary foods in infant feeding .. 301
Prostate, cancer of 461
— disappearance of glycosuria after operations on 205
Prostate, diseases of 458
— tubercle bacilli in urine from .. 622
Prostatectomy, choice of route in .. 459
— perineal, urinary fistulæ after .. 652
Prostatic hypertrophy, conditions simulating 458
— — ionic medication in 59
— bars, Young's punch operation for .. 461
Prostatitis, chronic 462
Protargol in Eustachian catarrh .. 395
— chronic gleet .. 270
Proteid diet in tuberculosis of childhood 628
— exchange, effect of radium and thorium on 64
Protein restriction in gastrogenic diarrhœa .. [illegible]
Protein-free diet in nephritis 375
Proteins, useless in rectal feeding .. 483
Proteinuria 462
— nodules and myelomata with .. 464
Protease, test for, in pancreatic secretion 411
Proteolytic fermentation, reaction of fæces in 235
Pruritus ani .. 118
— — resorcin in 507
— [illegible]
— hysterical, suggestion treatment in 565
— [illegible] in [illegible]
— in pregnancy, serum treatment .. 457
— x-rays in [illegible]
Prurigo of Hebra, human blood injections in .. [illegible]
Pseudo-calculus of the kidney 44
Pseudo-fracture of spinal transverse processes 527
Pseudo-glanders (*see* Glanders) 258
Pseudo-leukæmic splenic anæmia, x-ray treatment of 48
Psoriasis .. 464
— [illegible]
— ionic medication in 59
— [illegible] in [illegible]
[illegible] suggestion treatment in [illegible]
Psycho-analysis [illegible]
— methods 563
Psychoses of puberty, antithyroid serum in 3
[illegible] (see Suggestion) [illegible]
Puberty, antithyroid serum in psychoses of 3
[illegible]
Public health 670
[illegible]
Puerperal sepsis, vaccine therapy in .. 34
[illegible] treatment and exercises in .. [illegible]
— ovarian tumours complicating .. 409
[illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]

PAGE
Pulmonary tuberculosis (*see* Tuberculosis)
Pulse, alternating 280
— irregular 279
— — in thoracic aneurysm 109
Pulse-rate, effect of aconite on 1
Pulse variations in heart-block 288
Pulv. glycyrrhizæ co. in arteriosclerosis 122
Pulverettes for administration of powders 731
Pumice stone in hypertrichosis 296
Punch operation for prostatic bars and contracture 401
Puncture fluids 407
— in gonorrhœal arthritis 268
Pupil reflex in cerebrospinal syphilis .. 587
Purgation, effect in heart disease .. 284
— in hydrothorax complicating heart disease 279
Purin metabolism, effect of radium substances on 64
Purin-free diet in gout 270
Purpura 468
Purpura fulminans following scarlet fever 501
— *x*-ray treatment 50
Pus, excretion of urotropin in 13
Pustules, acne bacillus as cause of .. 86
Putrefaction, intestinal, as cause of diabetes and pancreatic disease 204
— — reaction of fæces in 235
Putrefactive dyspepsia and catarrh, oxygen insufflation for 20
Pyæmia, colloidal silver in 29
Pyelitis in children 469
— — diagnosis 471
— — treatment 472
Pyelography in diagnosis of horseshoe kidney 313
— — hydronephrosis 319
— — ureteral obstruction 650
Pyelotomy for stone, indications and technique 315
Pyloric carcinoma 549
— obstruction by a gall-stone 137
Pyloric stenosis, congenital .. 474
— — — surgical and medical treatment 475
— — — *x*-ray diagnosis of 40
— ulcer, urotropin in 13
Pyne-U-Ca health box 712
Pyorrhœa alveolaris in causation of uveitis 306
Pyramidon in gonorrhœal arthritis .. 268
Pyrogallol ointment in psoriasis 465

QUARRYMEN, incidence of phthisis amongst 686
Quinine in arteriosclerotic vertigo .. 66
— endemic anæmia of children .. 697
— gonorrhœal arthritis 268
— infection, with aspiration, in liver abscess 94
— — in pemphigus 428
— in lupus erythematosus 350
— moist dermatoses 511
— and urea, with general anæsthesia, in major surgery 104
— — pneumonia 443
Quinoidine in malaria 353
Quinton's marine plasma in infantile diarrhœa 207

ROGERS, L., 90, 133, 138, 171, 191, 199, 213, 222, 258, 271, 331, 333, 350, 363, 369, 416, 437, 499, 506, 518, 541, 547, 619, 649, 666, 668, 669; Richards, G. L., 155, 216, 218, 325, 395, 612, 666
Rabies, culture of virus of 476
— salvarsan in 27
Rabbit's serum in chronic purpura .. 469

PAGE
Radiations, effect on normal and pathological tissues 47
Radio-activity and electrotherapeutics 38
— in etiology of cancer 178
Radiography (*see X*-rays)
Radiology, review of 38
Radiotherapy in gonorrhœal arthritis .. 268
— useless in endemic anæmia of children 97
Radiothorium (*see* Thorium) 60
Radium and allied substances 51
Radium, brilliant results in early otosclerosis 409
— in cancer 179
— disappointing in lupus erythematosus 350
— effect on seed growth 38
— in epithelioma of the skin 507
— eye diseases 233
— great value of, in inoperable cancer of uterus 660
— Institute, Report of 51
— in skin diseases 514
— and *x*-rays compared in treatment of cancer 46
Radius, dislocation of head, with fracture of ulna 253
Rag flock in bedding, legal decision re 681
Railway spine, malingerers and 359
— — organic basis for 519
Rainfall, relation to dysentery in India 91
Rashes complicating infectious diseases 232
Rat-bite fever 470
Rats as plague carriers 439
Raynaud's disease, association with lupus erythematosus 350
— — "blue brain" a mild form of .. 548
Rectal cancer, charts showing extension of 478
— — radium and *x*-rays in .. 46, 51
Rectal diseases 478
Rectal feeding 483
— palpation in chronic appendicitis .. 117
— ulcers and fissures, ionic medication in 59
Rectum, primary melanotic tumours of 482
Red corpuscles, effect of radio-active substances on 64
— — fragility of 147
Reformatories under Inebriates Act .. 766
Refraction, errors of 483
Regional anæsthesia in shock prevention 108
Relapsing fever (*see* Spirochætosis) .. 541
Renaglandin (suprarenal extract) in tampons for hæmorrhage .. 730
Renal calculus 314
— — simulated by seminal 503
— colic 315
— disease a cause of intermittent limp 122
— — general review of 82
— — hypertensive 374
— — *x*-ray diagnosis of 44
— efficiency, amylolytic-ferment test for 658
Renal efficiency, estimation of 485
— infection, post-operative 321
— inflammations, agmel for 725
— lesions, relation to spinal deformity 530
— tuberculosis 317
Reniform in ozæna 410
Reproductive glands, effect of radio-active substances on 65
Respiratory tract, formaldehyde inhalants in affections of 728
Rest in auricular flutter 133
— eczema 221
— erythema nodosum 233
— fibrositis 238
— Graves' disease 264
— heart disease 282
— hydrothorax complicating heart disease 279
— hyperpiesis 154

PAGE
Rest in post-operative thrombo-phlebitis [illegible]
— — rheumatism in childhood [illegible]
— — rheumatoid arthritis 124
— surgical tuberculosis 637
Resonance impaired in diagnosis of typhoid fever [illegible]
Resorcin in chronic conjunctivitis .. 233
— ointment in keratodermia blennorrhagica 310
— properties of 507
— toxic effects from 508
Respiration of air under low pressure in intermittent lump 122
Respiratory metabolism, stimulating effect of thorium on 64
— movement, abdominal, in diagnosis of pericarditis 429
— muscles, effect of magnesium salts injections on 600
— symptoms in thoracic aneurysm .. 109
Resection of stomach for cancer .. 553
Resin ointment in eczema 221
[illegible] method of radiography of larynx [illegible]
[illegible]
Retrobulbar neuritis, guaiacol diaphoresis in [illegible]
Retroflexion and retroversion of uterus, operation for 662
Retrograde incarceration of intestines .. [illegible]
Retroversion, post-partum, cause and treatment [illegible]
Retina, diseases of .. . 488
— [illegible] detachment of, results of treatment . .. 489
Retinitis proliferans, thyroid extract in [illegible]
Rhubarb in intestinal dyspepsia in children 216
Rheumatic affections, radio-active treatment of [illegible]
— — relation to ulcerative endocarditis 225
— carditis and auricular fibrillation [illegible]
— children, special homes needed for .. [illegible]
— diseases seminal vesiculotomy for .. [illegible]
Rheumatic fever 490
— infection, bacteriology of [illegible]
Rheumatism, cardiac, treatment and [illegible] 282
Rheumatism in childhood [illegible]
— — frequency and importance of [illegible]
— — prognosis and treatment .. [illegible]
— colloidal silver in [illegible]
— gonorrhœal, vaccine therapy in 35
— ionic medication in .. [illegible]
[illegible]
[illegible]
— phylacogen, treatment of [illegible]
[illegible]
— relation between erythema nodosum and .. [illegible]
Rheumatoid arthritis (*see* Arthritis, rheumatoid) [illegible]
— — ionic medication in 59
[illegible]
— vaccines in [illegible]
Rhinophyma [illegible]
Rhinophyma, radiotherapy in .. [illegible]
Rhinoplasty [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Ringworm [illegible]
[illegible]
— [illegible]ation in [illegible]
— treatment [illegible]
[illegible]

Roboleine, a substitute for cod-liver oil 731
Rodent ulcer, carbon dioxide snow in .. 513
— — of eyelids, radium in 233
— — ionic medication in 59
— — [illegible] in [illegible]
— — [illegible] in [illegible]
Roger's hypertonic saline treatment of cholera [illegible]
Röntgen rays (*see* X-rays)
Rosacea, carbon dioxide snow in .. 513
— ichthyol in 511
— resorcin in 507
[illegible] in diagnosis of typhoid fever [illegible]
Rosenbach's tuberculin 71
Rosenbloom's tests for nitrogen in urine 657
Ross-Jones test for albumin in cerebrospinal fluid 189
Round-ligaments, method of shortening 662
— [illegible] [illegible]
— — wermolin for 37
Rubella leucocyte count in diagnosis from measles 498
Rue, oil of, small emmenagogue value of 9
Rupture of bladder 144

STEWART, P., [illegible]
Smith, J. S. K., 528
Sacral anæsthesia .. [illegible]
Salicin in lupus erythematosus .. [illegible]
Salicyl ionization in acute fibrositis [illegible]
Salicylate of sodium in advanced phthisis [illegible]
— — gonorrhœal arthritis 208
— — properties and methods of use .. 24
— test in cancer .. [illegible]
Salicylates in cardiac rheumatism [illegible]
— dosage in acute rheumatism .. [illegible]
— in fibrositis 238
— pericarditis [illegible]
— rheumatism in childhood 495
— rheumatoid arthritis .. [illegible]
— useless in erythema nodosum [illegible]
Salicylic acid in lupus erythematosus 350
— — [illegible]
— — [illegible] 33
— and benzoic acid ointment in ringworm [illegible]
— ointment in psoriasis .. [illegible]
Salicylo-salicylic acid (diplosal) .. 9
Saline aperients in fibrositis [illegible]
— [illegible]
— hypertonic, in cholera [illegible]
— infusion after operation for vesical rupture [illegible]
— injections in infantile diarrhœa 207, [illegible]
— — in sciatica .. [illegible]
— [illegible] born .. [illegible]
[illegible] 49
[illegible]
Salol in enuresis [illegible]
— goitre [illegible]
— [illegible]
— [illegible]
Salpingitis [illegible] its Media) .. [illegible]
Salt, [illegible]
Salvarsan [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible]
— [illegible] 353
— [illegible] 573
— [illegible] 591
— [illegible] 27
— combined with mercury treatment .. [illegible]
— [illegible]
— [illegible]

PAGE
Salvarsan, deaths under .. . 574
— disappointing in endemic anæmia of children . 97
— in general paralysis . . [illegible]
— interstitial keratitis . .. [illegible]
— leprosy 333
— pellagra .. . .. . [illegible]
— pemphigus foliaceus 428
— pernicious anæmia . . . 99
— plague 440
— primary sores of mouth and throat .. [illegible]
— poisoning 594
— powder for chronic ulcers .. [illegible]
— rapid cure of yaws with . . 668
— rectal administration of . 579
— as specific in Oriental sore .. .. [illegible]
— in syphilitic arthritis 128
— — heart disease . 277
— syphilis during pregnancy . [illegible]
— treatment, dangers and complications 579
— in ulcerative endocarditis .. . 227
Sanatoria for tuberculosis [illegible]
Sanatorium treatment in laryngeal tuberculosis .. [illegible]
— treatment of phthisis, results .. [illegible]
— — surgical tuberculosis .. . [illegible]
— — tuberculosis *v.* dispensaries .. 74
Sandalwood oil in psoriasis .. . [illegible]
— — as a urinary antiseptic .. .. [illegible]
— — in urinary infections .. . [illegible]
Sand-fly fever . . 499
Sawdust-soaked as larvicide in malarial districts 352
Sanitation, influence on plague prevention 439
Sanokatzin tuberculin 72
Saphenous-femoral anastomosis for varix 665
Sapokrol, a new germicide and disinfectant . . [illegible]
Saponin bodies, removal from digitalis preparations .. .. .. [illegible]
Sarcoma of bone, *x*-ray diagnosis of .. 43
— brain (*see* Brain, Surgery of) .. .. [illegible]
— cells, inhibitory effect of gamma radiations on 47
— Graves' disease secondary to .. 262
— interscapulo-thoracic amputation for 95
— of nose, electrical methods in .. 382
— radiotherapy in 51
— of spinal cord .. .. [illegible]
— vagina .. .. [illegible]
Sauerbruch chamber in control of open pneumothorax .. .. .. [illegible]
Scales, spring balance for . . [illegible]
Scarlet fever 499
— — otitis in .. .. [illegible]
— red in corneal lesions 28
— — dressing after mastoid operation 403
— — ointments, new brands of . [illegible]
— — in ozæna .. .. [illegible]
— — poisoning from 28
Schizotrypanum cruzi in etiology of thyroiditis .. .. [illegible]
School, choice of, in lateral curvature of spine 540
— medical officers, legal decisions re .. [illegible]
Schoolboys, cardiac efficiency in . [illegible]
Schwabach test in prognosis of otitis media .. . .. . [illegible]
Sciatica .. .. [illegible]
— ionic medication for 59
— and malingerers 357
— *x*-ray treatment . . 48
Sclero-corneal trephining for glaucoma .. 259
Sclerodactyly with multiple subcutaneous calcinosis . .. . . [illegible]
Sclerosis, multiple, from spinal tumours [illegible]
— of muscles in ischæmic myositis . [illegible]
Sclerotics, blue .. .. .. [illegible]

PAGE
Scoliosis (*see* Spine, Lateral Curvature) [illegible]
Scopolamine, pre-anæsthetic use of . [illegible]
Scurvy, salvarsan in [illegible]
Seaside treatment of surgical tuberculosis [illegible]
Sea-water, good results in peritonitis . 29
— injections in infantile diarrhœa [illegible]
Sebaceous cysts, electrolysis in destruction of . [illegible]
Sebacious hypersecretion
Seborrhœa of face, resorcin in .. 508
— new method of applying sulphur in [illegible]
Seborrhœic keratosis of the lips .. [illegible]
Secacosnin, a sterile ergot extract [illegible]
Sedative, adamon and adalin as .. [illegible]
— aleudrin as a .. .. [illegible]
— luminal as a .. . [illegible]
— paracodin as a .. [illegible]
— ureabromine as a .. [illegible]
Sedatives for insomnia during lactation 298
Sediments in urine, stains for .. .. [illegible]
Seed growth, effect of radium on [illegible]
Seminal calculi simulating nephrolithiasis [illegible]
Seminal vesicles, diseases of . [illegible]
— vesiculitis, chronic .. . 462
— — — vasotomy for .. . 504
— — good results of .. 504
Sennax, a new senna preparation [illegible]
Sensation, loss of, malingerers and 358, 361
Sensitized vaccines 37
Septic absorption in causation of uveitis 306
Septicæmia .. .. .. [illegible]
— after removal of adenoids .. . 88
— vaccine therapy in .. .. .. [illegible]
Serum analysis in diagnosis of pregnancy [illegible]
— antistaphylococcic, good results from [illegible]
— blood, in hæmorrhages of the newly-born .. .. .. 272, [illegible]
— diagnosis of tuberculosis 623
— gelatinized, in hæmorrhagic syndrome of infectious diseases . .. 640
— hæmatinic, in anæmia in children .. [illegible]
— horse, coagulose as hæmostatic .. [illegible]
— reaction in cancer .. .. .. [illegible]
Serum therapy in cerebrospinal fever .. 187
— cerebrospinal syphilis .. .. 591, [illegible]
— chronic purpura .. . 469
— congenital pyloric stenosis .. 476
— of dermatitis in pregnancy .. . 457
— diphtheria, dosage 209
— disappointing in Graves' disease .. [illegible]
— in gonorrhœa 268, 269
— plague 440
— pyelitis of children .. . .. [illegible]
— skin diseases .. . . [illegible]
— tetanus 600, 603
— of tuberculosis 68
— ulcerative endocarditis . .. 227
Serofibrinous effusion injections in tuberculous pleurisy 441
Serology of blood examination 150
Seven-day fever .. .. [illegible]
Sex incidence in pellagra .. .. [illegible]
— — peripheral stasis .. .. [illegible]
— — pyelitis of children .. . 470
— — rheumatism in childhood .. 491
Sewage disposal, legal decisions re . 682
Sewers and drains, legal decisions re 678
Sexual abnormalities, psycho-therapy in 566
— changes, effect of pineal and pituitary glands on 435
— glands, relation of thymus gland to [illegible]
— infantilism, dyspituitarism and . 437
— trauma in production of neuroses 466, [illegible]
Shipway's apparatus for intratracheal anæsthesia 104
Shock, nitrous oxide anæsthesia reducing [illegible]
— prevention, anoci-association in 77, 104
— — — syringe for .. 702
— — regional anæsthesia in .. . [illegible]

PAGE
[illegible] [illegible]
Short-circuiting the large intestine, late results of .. [illegible]
Shotted subcuticular suture [illegible]
Shoulder, test of malingerers for weakness of .. .. [illegible]
Sidarhombifolia cubilguitziana extract in [illegible] .. .. [illegible]
Sigmoid, diverticulitis of the . [illegible]
— sinus, diagnosis of thrombosis of [illegible]
Silicic acid in cancer [illegible]
Silver arsenite, therapeutic indications ..
— colloidal, therapeutic indications [illegible]
— — in [illegible] syndrome of intestinal diseases . 640
— iodide emulsion in renal skiagraphy .. [illegible]
— nitrate in eczema 220
— — in Eustachian catarrh [illegible]
— — in gonorrhœa [illegible]
Simulium reptans in etiology of pellagra [illegible]
Sinus diseases, x-ray diagnosis of [illegible]
— thrombosis . [illegible]
Sinuses, sugar as application to [illegible]
Sinusitis [illegible]
— acute, vaccines in [illegible]
— after removal of adenoids 58
Siphon treatment of empyema [illegible]
[illegible]
[illegible] ration of .. [illegible]
— — general review of .. [illegible]
— — [illegible] [illegible]
— disinfection, alcoholic paste of kaolin in .. [illegible]
— — alcoholic solution of iodine for .. [illegible]
Skin, epithelioma of [illegible]
— eruptions in pellagra of children [illegible]
Skin, general therapeutics of .. [illegible]
— lesions of pellagra [illegible], 420
— leukæmic eruptions of the [illegible]
— rashes caused by atophan 4
— reaction in carcinoma .. [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
Skin-grafting [illegible]
— — after excision of breast .. [illegible]
— — mastoid operation .. 402
— — [illegible] [illegible]
Skin tuberculosis of [illegible]
[illegible] [illegible]
Sleeping sickness (see Trypanosomiasis) [illegible]
[illegible]
[illegible] [illegible] [illegible]
Small pox [illegible]
[illegible] 684
Snake-bite 518
[illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]
Soaps in eczema .. [illegible]
Societies, medical and scientific . [illegible]
[illegible] [illegible]
— [illegible] [illegible]
— — [illegible] [illegible]
— — [illegible] [illegible]
— [illegible] [illegible]
— — [illegible] retina [illegible]
— hydrate in ringworm .. [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— [illegible] [illegible]
— — in urinary infections .. [illegible]
— in enuresis .. [illegible]
— — [illegible] [illegible]
— [illegible] [illegible]
[illegible] [illegible]
— — fibrositis [illegible]
— — properties and methods of use .. 24
— salts, infusion in pregnancy toxæmia [illegible]
— sulphate in functional derangement of the liver [illegible]
— — [illegible] [illegible]
Soil for residence in fibrositis [illegible]
Solidification of lung, methods of producing 345
[illegible] thorium on [illegible]
Sophol in Eustachian catarrh [illegible]
Sounds, heated, in gonorrhœa [illegible]
Spa treatment in arteriosclerosis [illegible]
— — fibrositis [illegible]
Spas, principal British .. [illegible]
Spastic contractions, resection of nerve roots for [illegible]
Spectacles, prescription of [illegible]
Sphenoidal osteomyelitis after removal of adenoids [illegible]
— sinus suppuration, operation for [illegible]
— — x-ray diagnosis of diseases of 43
[illegible] excessive [illegible]
Spinal analgesia, favourable reports on [illegible]
— — in prostatectomy .. [illegible]
— — [illegible] [illegible]
— cord diseases, x-ray treatment of .. [illegible]
Spinal cord, surgery of [illegible]
— [illegible] [illegible]
— disease, malingerers and [illegible]
— tumours [illegible]
— — diagnosis and treatment .. [illegible]
[illegible] [illegible]
Spine, injuries to .. [illegible]
— [illegible] [illegible]
Spine, lateral curvature: treatment of exercises [illegible]
Spine, osteomyelitis of [illegible]
— [illegible] [illegible]
— typhoid [illegible]
Spirit lamp, improved [illegible]
[illegible] [illegible]
Spirochæta pallida in general paralytics [illegible]
— — life history of 568
[illegible] varsan on . [illegible]
Spirochætosis [illegible]
[illegible] [illegible]
Spleen, cysts of [illegible]
— [illegible] [illegible]
— lesions, relation to spinal deformity [illegible]
— [illegible] 47
[illegible] 544
[illegible] [illegible]
[illegible] 544
— [illegible] [illegible]
— [illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible] .. [illegible]
[illegible] [illegible]
Splenomegaly [illegible]
— [illegible] [illegible]
[illegible] [illegible]
Splints for fractured femur [illegible]
[illegible] [illegible]
Sporotrichosis [illegible]
[illegible] [illegible]
— [illegible] [illegible]
[illegible] [illegible]
Sprue [illegible]
Sputum laboratory tests 547
— albumin test in tuberculosis 547

PAGE
Sputum, stain for cells in 548
— tubercle bacilli in, staining methods 622
Squill in auricular fibrillation .. 283
— diuretic properties of 30
Squint (see Strabismus) .. 556
Stab wounds of heart 286
Stammering, suggestion treatment in .. 565
Staphylococcal origin of uveitis 307
— lesions, value of vaccine therapy in 34
Staphylococcus aureus in etiology of osteomyelitis of spine 541
— in empyema 223
— etiology of phlyctenular conjunctivitis 194
— specific action of sandalwood oil on 33
— sprays in diphtheria carriers 210
Staphyloid coccus, Crowe's, in rheumatoid arthritis 126
Starch baths in psoriasis 464
— digestion in intestine 235
Starvation of dyspnœa 166
Stasis, intestinal, complicating appendicitis 116
— — x-ray diagnosis of 41
— peripheral 548
State medicine 673
Static electricity as aid to hypnotism .. 561
— wave current in acute fibrositis .. 240
Steam, medicated, in asthma of children 130
Stegomyia mosquito and dengue .. 499
— — in etiology of yellow fever .. 669
Stenosis of larynx following diphtheria .. 331
— pylorus, congenital 474
Sterilization, formaldehyde in 10
— of hands, etc., chlormetacresol for .. 6
— hydrogen peroxide in 13
— of instruments, new appliances for 689
— of skin, alcoholic paste of kaolin in .. 14
— — alcoholic solution of iodine for .. 11
— water, ultra-violet radiation for .. 55
— women, radiation in 65
Sterilizers for dressings and instruments, improvements in 716
Stethoscope, improved 718
— use in suspected malingering .. 360
Still's disease, identity with rheumatoid arthritis 123
Stimulant effect of silver arsenite .. 4
Stokes-Adams syndrome (*see* Heart Block) 289
Stomach, acute dilatation of 555
Stomach, cancer of 549
— — analysis of duodenal contents in 412
— evacuator, new designs .. 718, 719
— — radiotherapy in 53
— — results of surgical operation .. 552
— dilatation, post-operative 392
— diphtheria of 209
— diseases *x*-ray diagnosis of 40
Stomach and duodenum, surgery of 550
— — intussusception of 555
Stomach, fibromatosis of .. 556
— hair-ball in, *x*-ray diagnosis of .. 40
— hour-glass 555
— lesions, relation to spinal deformity 530
— new apparatus for radiography of .. 40
— volvulus of 554
Stomatitis, salvarsan in 27
Stomoxys calcitrans in etiology of pellagra 421
Stone (*see* Calculus)
Stovain anæsthesia in prostatectomy .. 460
— in spinal analgesia 108
Strabismus 556
— Harman's new operation for 556
— partial tenotomy for 557
Straight-work exercises in lateral spinal curvature 537
Strains, massage after 16
Strangulated hernia (*see* Hernia) .. 290
— — in infants 290
Streptococcal infection, sensitized vaccines in .. .. .. [illegible]
— origin of otitis media 395
— origin of pruritus ani .. .. [illegible]
— origin of sinus thrombosis 407
— vaccines in rheumatoid arthritis .. 126
Streptococcus, association with ulcerative endocarditis 225
— pyogenes in cerebrospinal fluid .. 189
— vaccines, value of 34
Streptothricosis, operation for 348
— simulating phthisis 86
Strontium bromide in Graves' disease .. 264
Strophanthin, elimitation from tissues of 8
Strophanthus in auricular flutter .. 132
— cardiotonic action of 131
— in croupous pneumonia 442
— effect on paroxysmal tachycardia .. 285
— specific action on heart muscle 283, 284
Stricture of œsophagus 388
— ureter .. .. [illegible]
— urethra 652
Strychnine, action on heart of 284
— injection preceding tuberculin .. 73
Subclavian aneurysm 112
Subconjunctival advancement for squint 556
Subdeltoid bursitis, aspiration in .. 171
Sub-glottic œdema, post-bronchoscopic 170
Sugar as application to wounds and ulcers 30
— in blood, method of estimating .. 149
— heart disease 283
— legal decision on description of .. 677
Sugar-free diet in diabetes 202
Suggestion in therapeutics, indications and contraindications 564
Suggestion in therapeutics: its legitimate uses 558
— — method of procedure 559
Sulphate of sodium in functional derangement of the liver 343
— — intestinal dyspepsia of children .. 216
Sulph-hæmoglobinæmia 567
Sulphur as adjuvant in mercurial medication 581
— baths in psoriasis 464
— new method of applying to skin .. 30
— ointment in eczema 221
— — keratodermia blennorrhagica .. 310
— properties of 509
Sulphur-containing oxyproteids in urine in cancer 152
Sulphuric acid in furunculosis 254
Sumbul, unfavourable results of use .. 31
Sunshine treatment of surgical tuberculosis 637
Sunstroke, differentiation from heat exhaustion 290
Suprarenal extract in Graves' disease .. 264
— — of little value in enuresis 229
— — pernicious vomiting 456
— — scarlet fever 501
— gland, irradiation for arterial hypertension 48
Suprapubic drainage in cancer of prostate 462
— prostatectomy, method 459
Suppression of urine in blackwater fever 139
Surgery of the biliary tract 136
— bladder 139
— brain 155
— breast 160
— in epilepsy 159, 230
— of gangrene 254
— geyser for 699
— heart 286
— intestines 302
— kidney 311
— knee 321
— in labyrinthine vertigo 666
— leprosy 334

PAGE
Surgery of liver ..
[illegible]
[illegible]
— nerve roots
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
— rectum ..
[illegible]
— of spinal cord
[illegible]
[illegible] 550
[illegible]
— urethra ..
— uterus ..
[illegible]
Surgical instrument, sterilizing cases .
[illegible]
[illegible]
— operations, post-operative complications
[illegible]
[illegible]
[illegible]
[illegible]
— epiglottic, modified instrument for .
— of kidney 320
[illegible]
Sutures
[illegible]
[illegible]
[illegible]
Sycosis, ionic medication in
[illegible]
— x-rays in
Sympathetic, caffeine as stimulant of .. 5
Syncope in artificial pneumothorax 447
Synovitis, malingerers and
Syphilis
— of brain, operation in ..
[illegible]
Syphilis, cerebrospinal
[illegible]
[illegible]
[illegible]
Syphilis, congenital .. 55
[illegible]
— diagnosis
— of the ear
— etiology ..
[illegible]
— general review of
— Government action concerning
[illegible]
[illegible]
[illegible]
[illegible]
— of the liver
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

PAGE
[illegible]
— for ureteric catheters
Syringes, hypodermic, new designs in ..
Syringomyelia, x-ray treatment ..
Systolic bruit, incidence of

THOMPSON, A. H., [illegible]
[illegible]
Tabes, aleudrin in painful crises of
[illegible]
[illegible]
[illegible]
Table waters in arteriosclerosis ..
Tachycardia, paroxysmal
— with rheumatoid arthritis
Talc, borated, in moist dermatoses
Tansy, oil of, small emmenagogue value of
Tape-worm in a case of peritonitis
Tabagan in relation to plague
Teeth, carious, in etiology of gastric [illegible]
Telangiectatic granuloma
[illegible] 435
[illegible]
Tenotomy, partial, for squint .. 557
Test breakfast in gastrogenic diarrhœa 206
[illegible]
[illegible]
Testicle, inflammation of, in children .. 394
Tetanus
[illegible]
— general care of patient in
— preventive treatment ..
[illegible]
Tetany after thyroidectomy, treatment
Theobromine in angina pectoris ..
— with squill in dropsy ..
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
— — for urethral defects ..
[illegible]
[illegible]
[illegible]
[illegible] 244
[illegible]
[illegible]
[illegible] tion ..
[illegible]
[illegible]
localization of foreign bodies in .
Thorium
[illegible] 65
[illegible]
[illegible]
Thread worms [illegible] with .
[illegible]
[illegible]
[illegible]
[illegible]
Throat and nose, general therapeutics of
[illegible]
Thro[illegible]
[illegible]
[illegible]
[illegible]
[illegible] bromol derivative ..
[illegible]

PAGE
Thymol derivatives, new .. 1
— in goitre .. [illegible]
— in hookworm disease .. [illegible]
Thymotinic acid, a new thymol derivative 1
Thymus-gland extract in Graves' disease 264
— — relation to sexual glands [illegible]
— rôle of, in Graves' disease 610
Thyroid disturbances, Abderhalden's dialysis test in 150
— extract in arteriosclerosis .. 122
— — enuresis 229
— — [illegible] .. 241
— — gonorrhœal arthritis 269
— — psoriasis .. [illegible]
— — retinitis proliferans 234
— — skin diseases 515
— — tetany after thyroidectomy .. [illegible]
Thyroid gland, surgery of .. [illegible]
— medication in epilepsy 230
— preparations in tinnitus .. .. [illegible]
— relation to pituitary body 515
Thyroidectomized horse serum.. .. 732
Thyroidectin disappointing in Graves' disease 264
Thyroidectomy, calcium lactate in tetany after 264
Thyroiditis, acute non-suppurative 611
— parasitic 261
Thyrotomy for cancer of larynx.. .. 330
Tibia, fracture of spine of 321
Tic douloureux, high-frequency currents for 55
— see Neuralgia, Trigeminal, 377
Tick fever (*see* Spirochætosis) 541
Tics, suggestion treatment for 565
Time association in psycho-analysis .. 563
Tinea, cuprakrol a copper preparation for .. .. [illegible]
Tinnitus 612
— hysterical, suggestion treatment in.. 565
Tobacco in etiology of intermittent limp 122
Tongue, cancer of 614
Tongue, marginal resection of 614
Toe, great, swelling and redness in rheumatism in childhood 493
Tongue depressors, new designs.. .. 720
Tones in pellagra .. .. [illegible]
Tonsil instruments, new designs in 720, 721
Tonsillar operations, complications after 619
Tonsillectomy, technique of 617
— and tonsillotomy, relative value.. 616
Tonsillitis, association with erythema nodosum 232
Tonsils 616
— the avenue of infection in rheumatism in childhood 492, 494
— enlarged, in etiology of otitis media 401
— — *x*-ray treatment of 49
— site of primary lesion in tuberculosis of childhood 625
Torticollis congenital 610
Toti's operation for nasal duct obstruction 327
Toxæmias of pregnancy 455
Toxicology and industrial diseases .. .. .. [illegible]
T[illegible], manganese [illegible]
Trachea, bronchoscopy for foreign bodies in 167
Tracheotomy in acute non-suppurative thyroiditis 612
— laryngeal tuberculosis 330
Trachoma, carbon dioxide snow in 233, 513
— ionic medication in 59
Traction with operation for fracture .. 244
Trade union funds, immunity of .. 670
Trades directory 783
Transfusion of defibrinated-blood in severe anæmia 4
Transfusion in hæmorrhage of the newborn .. .. [illegible]
Transverse colostomy, advantages of .. 303
Traumatic neurasthenia .. [illegible]
— — malingerers and .. [illegible]
Treatment, dictionary of [illegible]
Trephining sclero-corneal limbus for glaucoma .. [illegible]
— suggested in neurasthenia [illegible]
— for traumatic epilepsy [illegible]
Trichocephalus dispar a cause of appendicitis.. .. .. .. [illegible]
Trichomonas intestinalis as cause of dysentery .. .. [illegible]
Trigeminal neuralgia (*see* Neuralgia Trigeminal 377
— — high-frequency currents in . 55
Trinitrin in angina pectoris .. 114
Trioxymethylene as a disinfectant .. [illegible]
Trixidin in sleeping sickness .. .. [illegible]
Trophœdema, Milroy's, relation of "blue brain" to .. .. [illegible]
Tropical diseases, general review of . [illegible]
— splenomegaly, identity of infantile infective anæmia with .. . 96
Truss, adjustable elastic.. 721
Trypanocide, trypasafrol as a .. .. [illegible]
Trypanosoma gambiense, action of galyl and ludyl on 580
Trypanosome causing thyroiditis .. 261
Trypanosomes, new varieties of.. . [illegible]
Trypanosomiasis 619
Trypasafrol as a trypanocide .. .. [illegible]
Trypsin in duodenal contents in pancreatic and gastric diseases 412, [illegible]
Tubal pregnancy .. .. [illegible]
Tubercle bacilli, staining methods .. 622
— of brain, operation for 155
Tuberculin, adverse opinion of 34
— analysis of results of treatment .. [illegible]
— cases, new designs .. .. .. [illegible]
— in conjunctival tuberculosis .. .. [illegible]
— dangers of 74
— in dementia paralytica . .. [illegible]
— diagnosis 70
— dispensaries, growth of 74
— dosage of 73
— effect on blood of .. .. .. [illegible]
— I. K. 72
— injections, new syringe for 701
— mitigatum ointment .. .. . [illegible]
— old, in lupus vulgaris.. . .. [illegible]
— outfits .. .. . [illegible]
— reaction in epidemic pneumonia .. 444
— in renal tuberculosis .. .. .. [illegible]
— Rosenbach .. .. [illegible]
— with sanatorium treatment in phthisis [illegible]
— in surgical tuberculosis . . [illegible]
— tests, importance in tuberculosis in childhood 627
— theory of action . .. .. [illegible]
Tuberculin therapy .. . 68
— in tuberculosis in childhood .. [illegible]
— — of the skin.. .. .. .. [illegible]
— variety to be used .. .. [illegible]
Tuberculo-mucin, Weleminsky's . [illegible]
Tuberculosan-Burow .. . [illegible]
Tuberculosis, artificial pneumothorax in [illegible]
— borcholin in 4
— of bronchial glands .. . 162
— in causation of erythema nodosum .. [illegible]
— formaldehyde inhalants in .. . [illegible]
— sanatoria for .. . [illegible]
Tuberculosis in childhood . [illegible]
— — diagnosis .. .. [illegible]
— — etiology 623
— — general review of .. . .. [illegible]
— — site of primary lesion . .. 625
— — sources of infection [illegible]

PAGE
Tuberculosis in childhood, treatment .. [illegible]
Tuberculosis, clinical pathology of 622
— [illegible]
— in etiology of orchitis in children .. [illegible]
— of glans penis .. [illegible]
— gold combinations in .. 11
— increase of cholesterin in blood in .. [illegible]
— [illegible] treatment [illegible]
— [illegible] in treatment of 18
— of mesenteric glands .. [illegible]
— in milk, Board of Agriculture Order re [illegible]
— notification of .. [illegible]
— oxygen injections in acute asphyxia due to [illegible]
Tuberculosis, pulmonary [illegible]
— — abortive type of .. [illegible]
— — albumin test of sputum in 547
— — Arneth blood count in [illegible]
— — bronchoscopy in .. [illegible]
— — [illegible]
— — misuse of term "influenza" in .. 630
— — [illegible] 86
— — treatment .. .. [illegible]
— — — by collapse 345
— — *x*-ray diagnosis of .. [illegible]
— relation to diabetes .. [illegible]
— renal (*see* Kidney, Surgery of) .. [illegible]
— — dysuria in .. .. [illegible]
— [illegible]
— solidification of lung in surgery of .. [illegible]
Tuberculosis, surgical 636
— surgical, dioradin in .. [illegible]
— — [illegible]
— — treatment .. [illegible]
— survey of tuberculin treatment in .. [illegible]
[illegible]
Tuberculous hygroma, action of carbenzyme on .. .. [illegible]
— iritis, hetol in .. .. [illegible]
— joints, etc., allyl sulphide in ..
Tuberculous meningitis .. 305
— [illegible] tions in [illegible]
— [illegible]
Tubolytin, watery extract of tubercle [illegible] .. .. [illegible]
Tufnell's treatment of aortic aneurysm [illegible]
Tumours of the bladder .. .. .. [illegible]
Tumours of the brain [illegible]
— [illegible]
— effect of radio-active substances on ..
— [illegible]
— endosteal, *x*-ray diagnosis of .. [illegible]
— of the kidney .. [illegible]
— larynx, suspension laryngoscopy in .. [illegible]
— [illegible]
Turbinals, inferior, nerve supply of .. [illegible]
[illegible]
— oil of, small emmenagogue value of ..
— [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Typhoid carriers .. .. [illegible]
— — removal of gall-bladder in [illegible]
Typhoid fever [illegible]
— — [illegible]
— — [illegible]
— — [illegible]
— — [illegible]
— — [illegible]
[illegible]
— — occasional low temperature in ..
— — [illegible]
— — relation to paratyphoid 414
— — symptoms ..
— — treatment ..
— uzara in diarrhœa of .. [illegible]
— spine
— vaccine, results of administration
Typhus fever
— — identity of Brill's disease with ..
Tyramine, cock's-comb test of ..
— therapeutic action of ..
Tyrosin in pathology of cataract

UPCOTT, H., [illegible]
Uebergangsformen, or splenocytes
[illegible]
— [illegible]
— [illegible]
— peptic, of œsophagus ..
— simple solitary, of bladder
— [illegible] application ..
Ulcers
— adhesive plaster as direct dressing for
— carbon dioxide freezing in
— of cornea, scarlet red in
— ionic medication in
— [illegible]
— [illegible]
Ulceration, intestinal, character of fæces in ..
Ulcerative sporotrichosis ..
Ulna, fracture of, with dislocation of [illegible]
Ultra-violet rays in alopecia areata
— [illegible]
[illegible]
Umbilical infection, in the newborn 648
Uncinariasis .. .. [illegible]
[illegible] re-infection with thread-worms ..
[illegible] from ..
— post-choleraic ..
— [illegible]
Urea hydrochloride and quinine in major [illegible]
— [illegible]
[illegible]
[illegible]
Ureteral obstruction
[illegible]
— — syringe for .
Urethra, double
Urethral defects, Thiersch grafting for .
Urethral diseases
— [illegible]
— [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
— [illegible]
[illegible]
[illegible]
— [illegible]
— — [illegible]
— — [illegible]
— — [illegible]

PAGE
Urinary complaints, seminal vesiculotomy for 504
— in women [illegible]
— fistulæ after perineal prostatectomy [illegible]
Urinary incontinence in women 654
Urinary infections 654
— inflammations, agmel for 725
— surgery, general review of 83
Urine, Bence-Jones' protein in [illegible]
— Burnam's test for formaldehyde in .. 10
— diastase in, in interstitial pancreatitis 411
— examination in pyelitis of children .. 471
— — rheumatoid arthritis 126
— formaldehyde in, after urotropin 12, 655
— specimen glass, improved [illegible]
— suppression of, in blackwater fever .. 139
Urine tests 656
— — in diagnosis of cancer 181
— tubercle bacilli in 622
Urino-genitary operations, spinal analgesia in 108
Urobilin in urine in malaria 352
Urotropin, action as urinary antiseptic .. 32
— in cerebrospinal fever 157
— cirrhosis of the liver 341
— effect on urine of general paralytics 596
— in enuresis 228
— excretion in pus 13
— formaldehyde in urine after .. 12, 655
— in goitre 262
— otitic meningitis 404, 406
— pellagra 427
— pyelitis of children 472
— test for formaldehyde in urine after 10
— therapeutic indications for 12
— in typhoid fever 642
— urinary infections 654
Urticaria 659
— human blood in 512
— pituitary and suprarenal extract in 515
— vaccine-therapy in 512
Uterine abnormalities, Cæsarian section for 324
— contraction, synthetic hydrastinin in 13
— disorders, suggestion treatment in .. 566
— hæmorrhage, erystypticin in .. 9
— — renaglandin tampons for .. 730
— mucosa, radiotherapy in epithelioma of 51
— myoma, radiation in 65
— — x-ray treatment of .. 45
Uterus, cancer of 659
— — radiation in 65
— — x-rays and radium in .. 45, 65
Uterus, diseases of 659
Uterus, displacements of .. 662
— rupture of, after administration of pituglandol 22
Uva ursi as a urinary antiseptic 33
— — in urinary infections 655
Uveal tract, diseases of 306
Uzara, use in controlling diarrhœa .. 33

VON NOORDEN, C., on
Vaccination 664
Vaccination and cerebrospinal fever .. 155
— against tuberculosis .. .. [illegible]
— stations, educational .. .. [illegible]
Vaccine therapy in actinomycosis [illegible]
— — acne .. .. .. [illegible]
— — acute rheumatism .. .. .. [illegible]
— — cardiac rheumatism .. 282
— — chronic bronchitis and asthma .. [illegible]
— — enuresis 229
— — gonorrhœa 267, 268, 269
— — ligneous phlegmons .. .. [illegible]
— — otitic meningitis .. . [illegible]
— — pemphigus 427, 428
— — pertussis . . 433
— — plague 441
— — pruritus ani .. . .. [illegible]
Vaccine therapy in sprue .. [illegible]
— — rheumatism in childhood .. 495
— — rheumatoid arthritis .. 124, 126
— — septicæmia .. . [illegible]
— — skin diseases [illegible]
— — typhoid fever . 642
— — — — efficacy of .. [illegible]
— — ulcerative endocarditis 227
— — uveitis 308
Vaccines .. . . [illegible]
— — of little use in pyelitis of children 474
— — nose and throat catarrhs .. [illegible]
— new "stock" .. .. .. - .. [illegible]
— sensitized .. . . . [illegible]
— — relative safety of .. .. .. [illegible]
Vaginal clamp for hysterectomy [illegible]
— douche tube, new design [illegible]
— hæmorrhage at menopause, importance of education re 661
— mucosa, radiotherapy in epithelioma of 51
Vaginal sarcoma 664
— walls, operation in collapse of .. 663
Vaginitis, ionic medication in .. . 59
Valerian in phrenocardia .. . 279
— tinnitus 613
Valvular disease, prognosis 280
Vaporizer, improved design .. . 723
Vapour baths in rheumatoid arthritis .. 125
Vaquez's disease 453
Varicose ulcer, cure by cream-cheese application 648
— veins 665
Vascular anastomosis 120
Vas deferens, radiography of 44
Vasomotor phenomena of rheumatoid arthritis 123
Vasostomy for chronic seminal vesiculitis 504
Vegetarian diet in angina pectoris .. 114
— — psoriasis 404
Vein grafting after excision of aneurysm 120
Vena cava inferior, thrombosis of 665
Venereal diseases, general review of .. 83
— — Government action on 676
Venesection in croupous pneumonia .. 442
— typhoid fever 641
Ventilation in prevention of heat exhaustion 290
Ventrofixation for displaced uterus .. 663
Veratrone in eclampsia 456
Veratrum viride in eclampsia 457
Verruga peruana 666
Vertebral spines, auscultation over, in diagnosis of tuberculous bronchial glands .. .. .. [illegible]
— tumours 520
Vertigo 666
Vesical disease (*see* Bladder)
Veterinary Surgeons Act, decision under 685
Vibrion septique as cause of gangrene .. 255
Vinegar adulteration, legal decision re .. 677
Violet rays in alopecia areata .. . 90
Virus of epidemic poliomyelitis 450
— rabies, culture of .. .. .. [illegible]
Visceral crises, Franke's operation for .. 520
— — resection of nerve roots for . 524
— lesions, relation to spinal deformity [illegible]
— — suggestion treatment in 566
Visceroptosis . . . 667
Vision, statistics after operation for cataract 153
Vitreous opacities, guaiacol diaphoresis in .. . . [illegible]
Volkmann's paralysis (*see* Myositis, Ischæmic)
Volvulus of stomach 554
Vomiting of pregnancy 456
— nervous, suggestion treatment in .. 566

PAGE
Von Pirquet's reaction in epidemic pneumonia .. 444
— — in tuberculosis in childhood .. 627
Von Ruck's tubercle extract 72
Vulvitis as cause of enuresis 228

WALKER, J. W. T., [illegible]
Warts, carbon dioxide snow for 513
— ionic medication for 59
— [illegible] .. 14
Wassermann reaction for syphilis .. 71
— — [illegible] .. [illegible]
— — in cerebro-spinal syphilis .. [illegible]
— — compared with complement-fixation 265
— — in congenital keratitis and deafness .. [illegible]
— — — syphilis 598
— — diabetes .. [illegible]
— — diabetic acidosis 204
— — negative in spirochætosis .. [illegible]
— — in syphilis of heart and aorta .. [illegible]
Water injections, healing of syphilitic ulcers after.. 578
— sterilization, ultra-violet radiations for .. [illegible]
— supply, in etiology of goitre 260
— — [illegible] .. [illegible]
— — in urticaria .. [illegible]
Wax, impacted in ear, causing severe cough 199
Weaning, unnecessary 297
Weavers (cotton), unusual form of illness [illegible] .. [illegible]
Weber's test in prognosis of otitis media 399
Weight loss, causes of, in typhoid fever 643
— reduction in stout bronchitics .. 160
— traction in contraction ring 325
Weil's disease, distinction from catarrhal jaundice 300
Weleminsky's tuberculo-mucin 72
[illegible] .. [illegible]
Wertheim's panhysterectomy, clamp for 693
[illegible]
West's operation for nasal duct obstruction 327
Wheelhouse operation for stricture, [illegible] .. [illegible]
[illegible] .. [illegible]
[illegible] of femur 251
[illegible] .. [illegible]
Widal reaction in typhoid fever.. .. 641
— — typhus 647
[illegible] ness.. 620
Wilms' method of perineal prostatectomy 460
— operation of rib mobilization .. 348
[illegible] .. [illegible]
[illegible] .. [illegible]
Women, incontinence of urine in .. 654
[illegible] .. [illegible]
[illegible] .. [illegible]
[illegible] .. [illegible]
[illegible] .. [illegible]
[illegible] .. [illegible]
[illegible] .. [illegible]
[illegible] .. [illegible]
Wounds of the heart 286
— iodine as sole dressing to clean .. 14
— of lung, indications for operation .. 347
— — treatment 348
— noviform in dressing of 19
— picric acid for 22
— [illegible] .. [illegible]
— [illegible] in dressing of .. [illegible]
Wrist, fractures about 252
Wrist-drop, exercises for.. 17
Writer's cramp, suggestion treatment and 565

X-RAY apparatus, new 39
[illegible] .. [illegible]
X-ray diagnosis
— — of bony conditions 43
— — [illegible] .. [illegible]
— — dystopic kidney 312
— — ethmoidal disease.. 328
— — gastric diseases 40
— — — and duodenal ulcer .. [illegible]
— — hour-glass stomach .. - .. 555
— — kidney diseases 44
— — laryngeal disease .. [illegible]
— — liver disease .. [illegible]
— — oesophageal cancer .. [illegible]
— — otitis media .. [illegible]
— — renal calculi .. [illegible]
— — thoracic aneurysm .. 110
— — — [illegible] .. [illegible]
— — tuberculosis in childhood.. .. 626
— — — bronchial glands 163
— — typhoid spine 639
— — [illegible] .. [illegible]
— localization of foreign bodies in thorax [illegible]
— [illegible] .. [illegible]
X-ray treatment [illegible]
[illegible] .. [illegible]
— [illegible] .. [illegible]
— [illegible] .. [illegible]
— [illegible] .. [illegible]
— [illegible] .. [illegible]
— disappointing in lupus erythematosus 350
— in eczema 220
— epithelioma of skin 507
— experiments in filtration of 45
— in inoperable cancer of stomach .. 554
— [illegible] .. [illegible]
— leukæmic eruptions 340
— [illegible] .. [illegible]
— [illegible] .. [illegible]
— [illegible] .. [illegible]
— [illegible] .. [illegible]
— [illegible] .. [illegible]
— surgical tuberculosis 638

Y[illegible] .. [illegible]
Yaws [illegible]
— luetin reaction in .. [illegible]
Yellow fever [illegible]
[illegible] .. [illegible]
[illegible] .. [illegible]
[illegible] .. [illegible]

Z[illegible] .. [illegible]
[illegible] .. [illegible]
— [illegible] .. [illegible]

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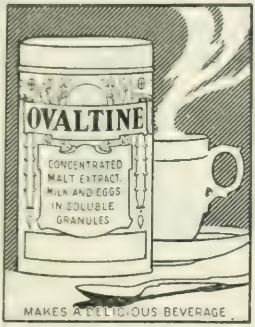
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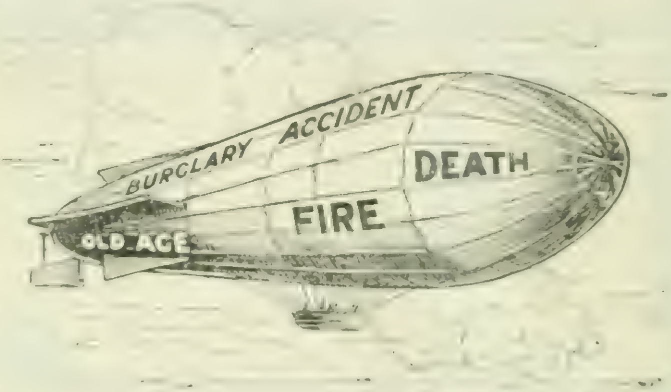

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List of Illustrations

PLATES

PAGE
Plate I.—Gall-stones (skiagram) . . . 39
Plates II, III.—Hair balls in the stomach (skiagrams) . 40–1
Plate IV.—[illegible] (coloured) . . . 91
Plate V.—Botryomycosis 134
Plates VI, VII.—Halsted's method of grafting after excision of breast 162–3
Plates VIII to X.—Types of epithelioma . . . 176–7
Plates XI, XII.—Tyrosin and cholesterin in cataractous lenses . 184–5
Plates XIII to XV.—Tuberculosis of the conjunctiva (*coloured*) . 194–6
Plates XVI, XVII.—Fracture of the neck of the femur . 244–5
Plate XVIII.—Whitman's method of treating fracture of the neck of the femur 250
Plates XIX, XX.—Familial dystrophy of hair and nails . . 274–5
Plates XXI, XXII.—Umbilical hernia 292–3
Plate XXIII.—Brennemann's experiments on curd formation . 299
Plate XXIV.—Intestinal surgery 303
Plate XXV.—Radiography of the larynx . . . 328
Plate XXVI.—Killian's suspension laryngoscopy . . 329
Plates XXVII, XXVIII.—Epithelioma of the œsophagus . 356–7
Plate XXIX.—Effective subdural drainage in temporal and cerebellar tumours (*coloured*) 406
Plate XXX.—Streptococcic meningitis (*coloured*) . . 406
Plate XXXI.—Intracranial venous circulation (*coloured*) . 408
Plates XXXII to XXXV.—Pellagra, as seen in America (*coloured*) 424–6
Plate XXXVI.—Metastatic nodules in long bones and skull (*skiagram*) 464
Plates XXXVII, XXXVIII.—Multiple myelomata (*skiagrams*) . 464
Plate XXXIX.—Clinical examination of puncture fluids (*coloured*) 468
Plate XL.—Bacillus coli infection of the kidney (*coloured*) . 474
Plates XLI, XLII.—Retinal vascular disease . . . 488–9
Plates XLIII, XLIV.—Rhinoplasty—Holländer's method . 496–7
Plate XLV.—Intraspinal tumours 522
Plates XLVI to L.—Scoliosis 531–7
Plate LI.—Multilocular cyst formations in the spleen . . 543
Plate LII.—Sporotrichosis 547
Plates LIII, LIV.—Sutures 568–9
Plates LV to LX.—Luetin reaction in diagnosis of syphilis (*coloured and plain*) 570–2
Plates LXI, LXII.—Eczema oris syphilitica (*coloured and plain*) . 590
Plate LXIII.—Uncinariasis 649

ILLUSTRATIONS

FIG. PAGE
1. Ionization with potassium iodide [illegible]
Ionization with zinc sulphate [illegible]
[illegible] apparatus for intratracheal anaesthesia [illegible]
X-ray examination of appendicular [illegible] [illegible]
6. Chronic appendicitis due to thread-worms . . 116
Porta's method of end-to-end suture of blood-vessels . 120
8. Rheumatoid arthritis, showing œdema of knee-joints . 124
9. Diagram showing angulation of duct after cholecystostomy 138
10. Hudson's appliance for drainage in operation for hydrocephalus . . [illegible]
11. Haynes' operation for internal hydrocephalus . . 159
12. Caliper-guide for bronchoscopy . . . 167
13, 14. Film of tracheo-broncheal tree to assist in location of foreign body 168–9
Lewisohn's rectangular telescopic œsophagescope . 170
Aspiration in subdeltoid bursitis 172
Skiagram of patent ductus arteriosus . . . 213
Activity of digestion in the intestine . . . 235
Distribution of microbes in the intestine . . 236
Hey Groves' pegs in operation for fracture . . 247–8
Whitman's abduction treatment in fracture of femur . [illegible]
Epiphyseal fracture of femur, indicating open operation . 252
Diagrams illustrating the formation of [illegible] in inguinal [illegible] [illegible]
Retrograde incarcerated hernia 292–3
Operation for fracture of tibial spine . . . 323
[illegible] suture forceps [illegible]
Muscles of forearm, affected by ischæmic contracture [illegible]
Härtel's method of injecting the Gasserian ganglion [illegible]
Bone transplantation for [illegible] [illegible]
Accessory pancreas in the jejunum . [illegible]
Dystrophia adiposogenitalis . . . [illegible]
Chart of pyelonephritis due to B. coli communis [illegible]
[illegible]
[illegible]
[illegible]

FIGS. PAGE
53.—Rhinoplasty, with skin flap from chest . . 496
54.—Injection in sacral canal for sciatica . . . 501
55.—Chart of case of septicaemia under vaccine treatment . 506
56–7.—Extramedullary tumour of spinal cord . . 521
58–9.—Intramedullary tumour of spinal cord . . . 522
60.—Lower end of ligamentum denticulatum . . . 526
61.—Showing intimate relation of pleura to intercostal nerve . 527
62–4.—Pseudo-fracture of transverse process of spine . . 528
65.—Horizontal scheme of advanced scoliosis . . . 530
66–70.—Lateral curvature of spine : treatment by creeping exercises 532-[illegible]
71.—Diagram showing site of perforation in gastric and duodenal ulcers 551
72.—Rayner Batten's fixation fork for operation for squint . 557
73.—Harman's partial tenotomy for squint . . . 557
74.—Harman's director-forceps for operation for squint . . 558
75.—Shotted subcuticular suture 597
76–80.—Marginal resection of tongue . . . 615
81–2.—[illegible] "dog" for tonsil guillotine . . . 618
83-186.—Illustrating recent medical and surgical appliances . 660-721

Index to Advertisers

ACCOUNT BOOKS (MEDICAL)
[illegible]
[illegible]

ACCOUNT CARD SYSTEM
[illegible]
[illegible]

ACCOUNTANTS (MEDICAL)
[illegible]

AMBULANCE—
[illegible]

ANATOMICAL MODELS—
[illegible]

ARTIFICIAL LIMBS—
[illegible]
[illegible]
Grossmith, W. R. [illegible]
[illegible]

ASSURANCE OFFICES—
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

ASYLUMS, INSTITUTIONS, AND HOSPITALS FOR THE MENTALLY AFFLICTED—
[illegible]
[illegible]
[illegible]
[illegible]
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ASYLUMS—*continued*.
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] Lincoln .. [illegible]
[illegible]
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[illegible]
[illegible]
[illegible]
[illegible] N. .. [illegible]
[illegible] Eastbourne .. [illegible]
[illegible] W. .. [illegible]
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AUTHORS' MANUSCRIPTS—
[illegible]

BANDAGES—
(*see* "Surgical Appliances")

BATHS, SPAS, HEALTH RESORTS—
[illegible]

BOOK ANNOUNCEMENTS—
[illegible]

BOOKSELLERS—
[illegible]

BOOTS AND SHOES—
[illegible]
[illegible]

PAGE

BRANDIES, WINES, SPIRITS, Etc.
Brown, Gore & Co., Brandies .. lxxxvi, [illegible]
Gautier Frères' Brandies .. lxxxvi, [illegible]
Rattray, A. Dewar, Whisky .. xxxvii

BRASS NAME PLATES
Sage, Fredk. & Co. Ltd. .. .. [illegible]

CARRIAGES FOR INVALIDS—
St. John Ambulance Association .. [illegible]

CHEMICAL PREPARATIONS, DISINFECTANTS, Etc.—
Allen & Hanburys Ltd. .. xlii, xliii
Alliance Drug & Chemical Co. .. xl
Bayer Co. Ltd. xlvii
Bresillon, M. & Co. xxxviii
Browne & Sayer, Sugar Test 935
Burroughs Wellcome & Co. .. lxvi–lxxi
Chesebrough Mfg. Co. (Cons'd) xlviii
Chinosol Hygienic Co... 946
Clay, Paget & Co. Ltd. 944
Denver Chemical Mfg. Co. lxiv
Evans Sons Lescher & Webb Ltd. xlv
Fellows Syrup of Hypophosphites .. lxi
Ferris & Co. Ltd. Back End Papers and 937
Formalin Hygienic Co. Ltd., Disinfectants xxiv
Gale, Schmidt & Co. .. lxxiv, [illegible]
Handford & Dawson 950
Hewlett, C. J. & Son, Ltd. 946
Hoffmann-La Roche Chemical Works Ltd. .. .. [illegible]
Hygienic Co. Ltd., Zana Baths xxxvi
Ingram & Royle Ltd., Natural Carlsbad Sprudel Salt 943
Kerol Disinfectants and Antiseptics lxxvi
Knoll & Co. xlix
Kuhn, B. & Co. 946
Lister Institute of Preventive Medicine xliii
Maltine Manufacturing Co. Ltd. .. ii
Martindale, W. lix
Medical Enterprise Society Ltd. .. xxxv
Oppenheimer, Son & Co. Ltd. .. xxxii
Parke, Davis & Co. 938
Phillips, Chas. H., Chemical Co. ..xxxiv
Pneumosan Chemische-Fabrik .. xliv
Quibell Brothers Ltd., Disinfectants lxxvi
Reynolds & Branson Ltd. xxiii
Riedel, The J. D., Co. .. .. l, li
Roberts & Co. 947
Robin's Laboratories 945
Rogers, Frank A. xxv
Saccharin Corporation Ltd. xlvi
S. P. Charges Co., Sulphaqua ..xxxiv
Steele & Marsh.. 947
Sumner, R. & Co. Ltd. .. vii, xiii
Symes & Co. Ltd. 936
Wander, A. Ltd. cxxi
Wassermann Institute.. .. xxxvii
Whiffen & Sons Ltd. xxxvi
Willows, Francis, Butler & Thompson Ltd. .. [illegible]
Woolley, James, Sons & Co. Ltd. .. 940
Wulfing, A. & Co., Cystopurin .. 941
Zimmermann, A. & M. .. xxxix, xli
Zimmermann, Chas. & Co. (Chemicals) Ltd. xxxv

DENTAL INSTRUMENTS AND APPLIANCES—
Dental Manufacturing Co. Ltd. .. [illegible]
Western Dental Mfg. Co. Ltd. .. 929

DIABETIC PREPARATIONS—
Brusson Jeune (Therapeutic Foods Co.) cxxi
Callard & Co. 949
"Pitman" Health Food Co. 950

DRESSINGS—
(see "Surgical Appliances")

EDUCATIONAL INSTITUTIONS, SCHOOLS, Etc.—
Barnardo's (Dr.) Homes .. lxxx
Colthurst House (Epileptic Boys) .. [illegible]
Home Students College Ltd. .. .. [illegible]
Kent Agricultural School .. [illegible]
London School of Massage .. [illegible]
Medical Correspondence College .. [illegible]
Normansfield, Hampton Wick (Mentally Deficient) .. [illegible]
Peile-Seyfang School of Health Exercises.. .. lviii
Royal Albert Institution, Lancaster (Feeble Minded Children) .. 906
Royal School for the Indigent Blind.. lx
School for the Deaf, Northampton .. 856
School of Fencing and Gymnasium, Bath 850
Stoke Park Colony, Stapleton (Mentally Defective Children).. .. [illegible]
Swedish Training School for Massage and Remedial Exercises lviii
University Examination Postal Institution .. .. .. [illegible]

ELECTRO-MEDICAL APPARATUS—
Cavendish Electrical Co. Ltd... .. xxi
Cox, H. W. & Co. Ltd. xx
Dean, Alfred E. 922
Medical Supply Association 914
Mottershead & Co. 934
Newton & Wright Ltd. xv
Sanitas Electrical Co. Ltd. xix
Siemens Brothers & Co. Ltd. .. xvii

ENGRAVERS—
Bale, Sons & Danielsson Ltd. .. [illegible]
Swain, John & Son Ltd. .. .. [illegible]

FOODS, MILKS, Etc.
Archeva Rusks 942
Brand & Co. Ltd., Beef Essence, etc. lii
Brusson Jeune (Therapeutic Foods Co.) cxxi
Cadbury's Cocoa 949
Callard & Co., Diabetic Foods .. 949
Casein Ltd. 948
Colman, J. & J. Ltd. Mustard, etc... 948
Fry, J. S. & Sons Ltd., Cocoa Front End Paper
Horlick's Malted Milk.. .. lxxxii, 795
Lemco lxxii
Maltine Manufacturing Co. Ltd. .. ii
Medical Enterprise Society Ltd. .. xxxv
Ovaltine cxxi
"Pitman" Health Food Co. 950
Valentine's Meat-Juice Co. lxxxv

FUNERALS, CREMATION, Etc.—
Bond, W. S. .. .. [illegible]
London Necropolis Co. 918

HEALTH RESORTS—
(*see* "Hydros., Baths, Spas," etc.)

HOMES FOR INVALIDS—
[illegible]
[illegible]
[illegible]
Beeches, Reigate Hill, Surrey 857
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Church Stretton Nursing Home .. 861
[illegible] Boys) 857
[illegible]
[illegible] leptic) 857
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] bridge Wells 866
[illegible]
[illegible]
Paris Medical Establishment .. 860
[illegible]
[illegible] Medical Men receiving 866
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
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HOSPITALS AND MEDICAL SCHOOLS—
[illegible]
[illegible]
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HOTELS AND BOARDING ESTABLISHMENTS—
[illegible]
[illegible]
Davos-Platz, Grand Hotel and Belvedere [illegible]
[illegible]
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HYDRO-THERAPEUTIC ESTABLISHMENTS, BATHS, SPAS, HEALTH RESORTS—
[illegible]
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[illegible]
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ILLUSTRATIONS—
[illegible]
[illegible]

INEBRIATES (HOMES FOR)—
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

PAGE

INEBRIATES (HOMES FOR)—*continued.*
Grove Retreat, Fallowfield 888
Hamond Lodge, Terrington St. Clement 888
Invernith Lodge, Colinsburgh, Fife .. 885
Melbourne House, Leicester 889
[illegible] Retreat, Wandsworth Common 888
Norwood Sanatorium, Beckenham Park 886
Sidlow Manor, Reigate 888
Spelthorne S. Mary and S. Bridget's, Bedfont . . [illegible]
Temple Lodge, Torquay 888

LIBRARY (MEDICAL AND SCIENTIFIC)—
Lewis, H. K. .. .. [illegible]

MASSAGE, EXERCISES, Etc.
Cottle, Percival C., Bath .. [illegible]
Edinburgh Institution 857
Harwood, Mrs., Chorlton-cum-Hardy, Manchester 858
London School of Massage, etc. . 850
Swedish Training School for Massage and Remedial Exercises . .. lviii

MEDICAL AGENTS AND SOCIETIES
Association of Medical Men receiving Resident Patients 866
London & Counties Medical Protection Society Ltd. 855
Manchester Medical Agency Ltd. .. 854
Medical Defence Union Ltd... .. 854

MICROSCOPES AND APPARATUS FOR PHOTOMICROGRAPHY AND BACTERIOLOGY—
Baker, C. xviii
Bausch & Lomb Optical Co... .. xvi
Davidson, F. & Co., Micro-Telescope xviii
Kodak Ltd. (Wratten Division), Photomicrography xiv
Leitz, E... xiv

MINERAL WATERS, NON-ALCOHOLIC DRINKS, Etc.—
Burrow, W. & J., Malvern Waters .. 942
Evian-Cachat Water . . liii
Hunyadi Janos Natural Aperient Water iii
Spencer, Layton & Co., "R.T.B." .. 950
Vittel Grande Source Waters .. 942

MISCELLANEOUS—
Adjustable Grate Co., Grates ..xxxiii
Bennett, J. O., "Pauma" Book Rest 928
Boulton & Paul Ltd., Wind Shelters.. 934
Fredericks, Sanatoria Buildings .. 918
Hobson, J. T. & Co., Revolving Shelters 935
Patent Pulp Mfg. Co. Ltd., Pulp Ware lv
Peile-Seyfang Foot-Rest for Children lviii
Sage, Fredk. & Co. Ltd., Brass Plates 924
Staples & Co., Mattress xxxiii

NURSES' INSTITUTIONS—
Co-operation of Temperance Male and Female Nurses, London 858
Lansdown Grove House, Bath .. 862
Leamington Spa Nursing Association 866
London Temperance Male and Female Nurses' Co-operation, London .. 859
Male Nurses' Association, London [illegible]

PAGE

NURSES' INSTITUTIONS—*continued.*
Mental Nurses' Co-operation, London [illegible]
Retreat, York (Mental Nurses) . [illegible]
Royal Devon and Exeter Hospital (Private Nursing Branch), Exeter.. 860
St. Luke's Hospital (Trained Nurses) 860
Temperance Male Nurses' Co-operation liv
Victoria Institute, Bournemouth . [illegible]

NURSING HOMES—
(*see* "Homes for Invalids.")

PRINTERS—
Wright, John & Sons Ltd. .. cxxxiv

PUBLISHERS—(*see* the Alphabetical List of Books and Periodicals, with Authors' names, page cxxxi)
Adlard & Son .. . . [illegible]
Ash, C., Sons & Co. Ltd. .. .. [illegible]
Bailliere, Tindall & Cox 807, 832, 841
Bale, J., Sons & Danielsson Ltd. . 805
Benninghoven (Dr.) . . . 806
Butterworth & Co. Ltd. .. lxii, lxiii
Cambridge Literary Agency 814
Cassell & Co., Ltd. .. .. 818, [illegible]
Churchill, J. & A. 820, 821
Doctors' Accountancy Bureau .. 806
Heinemann, Wm. 815
Henderson & Spalding 840
Hilton & Co. 812
Jones, Percival, Ltd. .. .. .. [illegible]
Lewis, H. K. 816, 817
Livingstone, E. & S. 822
Macmillan & Co. Ltd... .. . [illegible]
Scientific Press Ltd. .. .. .. [illegible]
Thacker, W. & Co. (Thacker, Spink & Co.) 824
Wright, John & Sons Ltd., cxxxiv, 787, 792, 804 811, 814, 825–829, 833, 858, 889, 905, 936, 942

RAILWAY ROUTES—
G.N.R. to Ripon Spa.. . . 870

SANATORIA—
Fritton Beeches, Norfolk 884
Home Sanatorium, Bournemouth .. 884
Mendip Hills Sanatorium 883
Moorcote Sanatorium, Eversley .. 861
Rostrevor Sanatorium, Warrenpoint.. 884
Rudgwick Sanatorium, Sussex .. 884
Ruebury Sanatorium, Osmotherley .. 883
Sanatorium St. Blasien, Black Forest lxxxii
Vale of Clwyd Sanatorium, Ruthin .. 883
Wensleydale Sanatorium, Aysgarth.. 884

SANATORIA BUILDINGS, SHELTERS, Etc.—
Boulton & Paul Ltd. 934
Fredericks 918
Hobson, J. T. & Co. .. .. .. [illegible]

SCHOOLS—
(*see* "Educational Institutions.")

SPAS—
(*see* "Hydros," etc.)

STAMMERING—
(*see* "Tutors.")

PAGE

STEAMSHIP LINES—

Bibby Line Mail Steamers [illegible]
Pacific Steam Navigation Co. [illegible]
Royal Mail Steam Packet Co.. . [illegible]

SURGEONS' APPOINTMENTS

Bibby Line Mail Steamers [illegible]

SURGICAL INSTRUMENTS AND APPLIANCES, BANDAGES, TRUSSES, Etc.—

[illegible] xxvi
Allen & Hanburys Ltd., Instruments [illegible]
Allen, J. & Sons, Turkish Bath [illegible]
Barth, Geo. & Co., Inhalers xxii
[illegible] [illegible]
[illegible] [illegible]
Clarke, John & Co. (Successors) Ltd., Bandages and Catheters [illegible]
[illegible] [illegible]
Critchley, J. & Sons, Splints, etc. [illegible]
Dental Manufacturing Co. Ltd., Dental Instruments 928
Domen Belts Co. Ltd. lxv
Down Bros. Ltd., Instruments 910-913
Egarté, Madame, Belts and Corsets .. [illegible]
Freeman, J., Orthopædic Footwear .. [illegible]
Gardner, J. & Son, Instruments [illegible]
Grossmith, W. R., Artificial Eyes and Limbs .. .. [illegible]
Harris, Philip & Co. (1913) Ltd., Instruments .. .. xxviii, xxix, xxx, xxxi
Hawksley & Sons, Instruments .. 951
Haywood, J. H. Ltd., Appliances .. 931
Hearson, Chas. & Co. Ltd., Incubators 924
Holborn Surgical Instrument Co. Ltd. [illegible]
Holden Bros., Natureform Footwear.. [illegible]
Holland & Son, Instep Arch Socks .. 933
Hospitals & General Contracts Co. Ltd. [illegible]
Liverpool Lint Co., Surgical Dressings [illegible]
Mayer & Meltzer, Instruments [illegible]
[illegible] [illegible]
Medical Supply Association, Instruments [illegible]
Millikin & Lawley, Instruments [illegible]
Oppenheimer, Son & Co. Ltd., Sprays xxxii
[illegible] [illegible]
[illegible] [illegible]
Reynolds & Branson Ltd., Ledger Cards [illegible]
Rice, Wm. S., Ltd., Trusses 930
Robinson & Sons Ltd., Dressings .. 926
Rogers, Frank A., Sprays xxv
[illegible] [illegible]
[illegible] [illegible]
[illegible] Turkish Bath [illegible]
[illegible] Ltd., Instruments, [illegible]

SURGICAL INSTRUMENTS, Etc.—continued [illegible]

[illegible] [illegible]
[illegible] [illegible]
Teske, C. A., Ltd., Instruments .. xxvii
[illegible] Instruments [illegible]
[illegible] Instruments [illegible]
[illegible] Dental Mfg. Co. Ltd. [illegible]
[illegible] Instruments [illegible]
Young, Archd., & Son, [illegible] [illegible]

THERMOMETERS—

Zeal, G. H. [illegible]

TRANSLATIONS [illegible] Medical Literature, etc.)—

Newbold, Miss A. [illegible]

TUTORS [illegible]

[illegible] [illegible]
[illegible] [illegible]
[illegible] etc.) [illegible]
[illegible] [illegible]
Kent [illegible] [illegible]
[illegible] ge, etc. [illegible]
Medical [illegible] College [illegible]
[illegible] [illegible]
[illegible] School of Health [illegible] [illegible]
[illegible] [illegible]
School for the Blind, Leatherhead .. [illegible]
School for the Deaf, Northampton .. [illegible]
[illegible] lviii
[illegible] [illegible]

TYPEWRITING—

Newbold, Miss A. [illegible]

VACCINE LYMPH—

[illegible] Calf Lymph [illegible]
[illegible] Calf Lymph [illegible]
[illegible] Ltd. [illegible]

X-RAY APPARATUS—

[illegible] Electrical Co. Ltd. [illegible]
Cox, H. W. & Co. Ltd. [illegible]
Dean, Alfred E. 922
[illegible] Ltd. [illegible] [illegible]
Medical Supply Association [illegible]
[illegible] & Co. [illegible]
[illegible] & Wright Ltd. [illegible]
[illegible] Electrical Co. Ltd. [illegible]
[illegible] & Co. Ltd. [illegible]

LIST OF BOOKS

ADVERTISED IN THE PRESENT VOLUME.

For a List of the Principal Medical Works and New Editions published during [illegible],
see page 733.

PAGE
Abdominal Hernia (BENNETT) *Longmans* 809
Abdominal Surgery (CURTIS) *Med. Pub. Co.* 810
Abdominal Viscera, Malignant Tumour Diagnosis of (SCHMIDT) *Heinemann* 815
Account Books, Medical .. .. *Lewis* 817
Account Books, Medical .. *Menzies* 806
Aequanimitas (OSLER) .. .. *Lewis* 817
Age and Old Age (WALSH) *Everett* 811
Anæsthesia, Local (SCHLESINGER) *Heinemann* 815
Anæsthetics (BUXTON) .. .. *Lewis* 816
Anæsthetics (HEWITT) .. *Macmillan* 823
Anatomical Diagrams .. .. *Bale* 805
Anatomical Models .. *Benninghoven* 806
Anatomy, Applied (SKIRVING) *Livingstone* 822
Anatomy, Catechism Series *Livingstone* 822
Anatomy, Surgical (WHITTAKER) *Livingstone* 822
Anatomy, Surgical Applied (TREVES & KEITH) .. *Cassell* 819
Appendicitis (ECCLES) .. .. *Bale* 807
Arteries and Angina Pectoris (ALLBUTT) *Macmillan* 823
Arthritis Deformans (LLEWELLYN) *Wright* 829

Bacteriology and Hæmatology (EMERY) *Lewis* 816
Bacteriology, Medical .. *Livingstone* 822
Bandaging and Surgical Dressing (PYE'S—CLAYTON-GREENE) .. *Wright* 936
Blood Cells, Biology of (GRUNER) *Wright* 825
Brain and its Membranes, Surgery of (BALLANCE) .. .. *Macmillan* 808
Brain and Spinal Cord, Anatomy (WHITTAKER) .. *Livingstone* 822

Cancer of the Breast (HANDLEY) *Murray* 807
Card Index System .. .. *Bale* 805
Cards, Ledger *Reynolds & Branson* xxiii
Case Book, Pocket .. .. .. *Lewis* 817
Cataract (SMITH) .. .. *Thacker* 824
Cerebral Decompression (BALLANCE) *Macmillan* 808
Charts and Clinical Figures .. *Bale* 805
Charts and Chart Holders .. *Wright* 861
Chemistry, Manual of (LUFF & CANDY) *Cassell* 819
Children, Diseases of (GOODHART & STILL) *Churchill* 820
Children in India (BIRCH) *Thacker* 824
Children, Medical Diseases of (MILLER) *Wright* 82[illegible]
Circulation and Respiration (BRUNTON) *Macmillan* 811
Circulation, Therapeutics of (BRUNTON) *Murray* 811
Clinical Memoranda for Practitioners (BRAND & KEITH) .. *Bailliere* 813
Clinical Methods (HUTCHISON & RAINY) *Cassell* 819
Colon, Diseaess of the (MUMMERY) *Wright* 828

PAGE
Cookery, Invalid and Convalescent (BIRD) .. .. *Wright* 942
Cranial Surgery (CURTIS) *Med. Pub. Co.* 810

Deafness, Giddiness, etc. (WOAKES) *Lewis* 810
Deformities (TUBBY) *Macmillan* 813, 823
Dental Anatomy and Physiology (HOPEWELL-SMITH) .. *Churchill* 821
Dental Surgery, Anæsthetics in (COLEMAN & HILLIARD) .. *Lewis* 817
Diagnosis of Main Symptoms, Index of Differential (FRENCH) *Wright* 825
Diagnosis, Medical (STEVENS) .. *Lewis* 817
Dictionary, German-English Medical (MEYERS) .. .. *Churchill* 821
Dispensing Made Easy (SUTHERLAND) *Wright* 829
Dreams (FREUD) .. .. *Heinemann* 815
Doctor's Daily Register (MENZIES) .. 806

Ear, Diseases of the (MILLIGAN & WINGRAVE) .. .. *Macmillan* 823
Electricity, Medical (JONES) .. *Lewis* 816
Electricity, Medical, Lectures to Nurses (HARRIS) .. .. .. *Lewis* 817
Electro-Therapeutics (HUMPHRIS) *Arnold* 814
Eye, Errors of Accommodation and Refraction (CLARKE) *Bailliere* 810
Eye, Handbook (SWANZY & WERNER) *Lewis* 817

Fæces of Children and Adults (CAMMIDGE) .. .. *Wright* 825
First Aid to the Injured and Sick (WARWICK & TUNSTALL) *Wright* 936
First Aid Wall Diagrams .. *Wright* 936
Fœtus, Malformations and Diseases (BIRNBAUM & BLACKER) *Churchill* 820
Fractures, Simple (BENNETT) *Longmans* 809
Fractures and Dislocations (STIMSON) *Churchill* 820
Fundus Oculi (JOHNSON) .. *Adlard* 834

Gastro-Intestinal Tract (WEGELE) *Heinemann* 815
Genito-Urinary Organs, Surgical Diseases and Injuries of (WALKER) *Cassell* 818, 819
Gout (LUFF) .. .. *Cassell* 819
Gummata (CURTIS) .. *Med. Pub. Co.* 810
Gynæcological Surgery (BERKELEY & BONNEY) *Cassell* 819
Gynæcology, Student's Handbook (HERMAN & MAXWELL) *Cassell* 819

Hair and its Diseases (WALSH) *Bailliere* 811
Hare Lip and Cleft Palate (BERRY & LEGG) *Churchill* 808
Hernia (ECCLES) .. .. *Bailliere* 807
Hygiene and Public Health (GHOSH) *Hilton* 812

PAGE
Hygiene and Public Health (PARKES & KENWOOD) Lewis [illegible]
Hygiene and Public Health (WHITELEGGE & NEWMAN) Cassell [illegible]
Hypnotism [illegible] [illegible]

Indigestion, Constipation, Liver Disorders ([illegible]) Baillière [illegible]
Industrial Gas Poisoning (GLAISTER & LOGAN) Livingstone [illegible]
Industrial Lead Poisoning (OLIVER) Lewis [illegible]
Infancy and Childhood, Diseases of (HOLT) Butterworth lx.
Infancy and Childhood, Hygiene ([illegible]) Livingstone [illegible]
Infancy, Nutritional Disorders of (VINCENT) Baillière [illegible]
Infants, Toxaemia in (VINCENT) Baillière [illegible]
Insanity (SAVAGE & GOODALL) Cassell [illegible]
Insanity (SUCKLING) Cornish [illegible]
Internal Diseases (FORCHHEIMER) Butterworth lxii, lxiii
Internal Secretions (SAJOUS) Butterworth lx.
Ionic Medication (JONES) .. .. Lewis [illegible]

Joints and Spine, Diseases (MARSH & WATSON) Cassell [illegible]

Kidney, Movable (SUCKLING) Cornish [illegible]
Knee Joint, Injuries and Diseases (BENNETT) .. .. Nisbet 809

Labour, Difficult (HERMAN) Cassell [illegible]
Landmarks and Surface Markings of the Human Body (RAWLING) Lewis [illegible]
Ledger, Medical: [illegible] [illegible]
Ledger, Medical .. .. .. Lewis 817
Life Assurance, Medical Examination for (HALL) Wright [illegible]
Liver Abscesses (CURTIS) Med. Pub. Co. 810
Liver, Gall-Bladder, and Bile-Ducts ([illegible]) Macmillan [illegible]
Lungs and Pleura (POWELL & HARTLEY) Lewis [illegible]

Malingering (McKENDRICK) Livingstone 822
[illegible]
Massage and Exercises (DOWSE) Wright [illegible]
Massage Primer (DOWSE) Wright [illegible]
[illegible] Lewis [illegible]
Materia Medica ([illegible]) Cassell [illegible]
Materia Medica ([illegible]) [illegible]
Materia Medica Notes ([illegible]) Livingstone [illegible]
Materia Medica, Pharmacy, Pharmacology, and Therapeutics ([illegible]) Churchill [illegible]
Medical [illegible] and [illegible] ([illegible]) [illegible]
Medical Jurisprudence for India ([illegible]) Thacker [illegible]
Medical Treatment ([illegible]) Cassell [illegible]
Medicine, [illegible] Series [illegible]
Medicine, Clinical ([illegible]) Butterworth [illegible]
Medicine, [illegible] Handbook [illegible] [illegible]
Medicine, New System of ([illegible] & [illegible]) Macmillan [illegible]
Medicine, Practical ([illegible]) Lewis [illegible]
Medicine, Practice of ([illegible]) [illegible] lxii, lxiii
Medicine, Practice of ([illegible]) [illegible]
Medicine and Hygiene, [illegible] ([illegible]) [illegible]

Medicine and Surgery, Gould & Pyle's [illegible] Lewis [illegible]
Medicine and Surgery (SAJOUS) Butterworth lxii, lxiii
Metabolism ([illegible]) Macmillan [illegible]
[illegible] Churchill [illegible]
Midwifery, Short Practice of (JELLETT) Churchill [illegible]
Midwifery, Synopsis of (BOURNE) Wright [illegible]
Midwifery, Wall Diagrams (BOURNE) Wright 827
Mind and its Disorders (STODDART) Lewis [illegible]
Mosquitoes of India (JAMES & LISTON) Thacker [illegible]
Movable or Dropped Kidney (SUCKLING) Cornish [illegible]

Natural Therapy and Climatology ([illegible]) [illegible]
Nitrous Oxide and Oxygen for Dental Purposes, Administration of (HEWITT) [illegible]
Nose and Throat (THOMSON) Cassell [illegible]
Nose and Throat (TILLEY) .. Lewis 816
Nurses, Explanatory Lectures for (HAWKINS-DEMPSTER) Wright 828
Nutrition of Infants (VINCENT) Baillière [illegible]

Obstetric Practice (BERKELEY & BONNEY) Churchill [illegible]
Obstetrics (WILLIAMS) [illegible]
Open-Air at Home (BATES) Wright [illegible]
Ophthalmic Operations (MAYNARD) Thacker [illegible]
Ophthalmology [illegible]
Ophthalmoscopic Diagnosis (ADAM) [illegible]

Pathology, Clinical ([illegible]) Churchill [illegible]
Pathology, Text-book of (ADAMI & McCRAE) Macmillan [illegible]
[illegible] Macmillan [illegible]
Pharmacy, Materia Medica, and Therapeutics ([illegible]) Baillière [illegible]
[illegible]
[illegible] Churchill [illegible]
[illegible] Wright [illegible]
[illegible]
Poisoning ([illegible]) Lewis [illegible]
[illegible]
[illegible] Wright [illegible]
[illegible] Golden Rules of ([illegible]) Wright [illegible]
Psychological Medicine (CRAIG) Churchill [illegible]
Public Health ([illegible]) Livingstone [illegible]
Public Health Chemistry and Bacteriology ([illegible]) Wright [illegible]
Public Health Law ([illegible]) Livingstone [illegible]

[illegible] Remedies and the Public Health ([illegible]) [illegible]

[illegible]
[illegible] Churchill [illegible]
[illegible]
Renal Diseases in Urinary Surgery ([illegible]) Cassell [illegible]
Rheumatism, Researches on (POYNTON & PAINE) Churchill [illegible]
Rheumatoid Arthritis ([illegible]) Wright [illegible]

PAGE
Sewage Disposal in the Tropics (CLEMESHA) *Thacker* 824
Sick Nursing and Home Hygiene (MACDONALD) .. *Wright* 850
Sigmoidoscope (MUMMERY) *Bailliere* 813
Skin Diseases (MORRIS) .. *Cassell* 819
Skin Diseases (SIBLEY) .. *Arnold* 810
Skin Diseases (WALSH) .. *Bailliere* 811
Skin Practice (WALSH) .. *Wright* 811
Small-pox, Diagnosis of (RICKETTS & BYLES) *Cassell* 819
Small-pox and Vaccination (HANNA) *Wright* 827
Small-pox and Vaccination in India (JAMES) .. .. *Thacker* 824
Spectacles, Prescribing of (PERCIVAL) *Wright* 827
Spine, Lateral Curvature of, and Flat Foot (SMITH) .. .. *Wright* 827
Sprue: Its Diagnosis and Treatment (BEGG) .. .. *Wright* 828
Stammering, Cleft-Palate Speech (BEHNKE) 856
Stomach, Diseases of (HABERSHON) *Cassell* 813, 819
Stomach, Diseases of (LOCKWOOD) *Lewis* 817
Surgery, Catechism Series *Livingstone* 822
Surgery, Introduction to (MORISON) *Wright* 828
Surgery, Manual of (STEWART) *Churchill* 821
Surgery, Minor (FOOTE) *Butterworth* lxii
Surgery, Operative (BINNIE) . *Lewis* 817
Surgery, Operative (TREVES & HUTCHINSON) *Cassell* 819
Surgery, Synopsis of (GROVES) *Wright* 826
Surgery, System of (CHOYCE & BEATTIE) *Cassell* 819
Surgery Urgent (LEJARS—DICKIE) *Wright* 826
Surgical Handicraft (PYE'S CLAYTON-GREENE) .. .. *Wright* 826
Surgical Nursing (BISHOP) *Wright* 828
Surgical Pathology and Morbid Anatomy (BOWLBY & ANDREWES) *Churchill* 820
Syphilology and Venereal Disease (MARSHALL) .. .. *Bailliere* 814
Syphilis (HUTCHINSON) .. *Cassell* 819

Teeth, Extraction of (GIBBS) *Livingstone* 822
Testis, The Imperfectly Descended (ECCLES) .. .. *Bailliere* 807
Throat, Nose and Ear, Diseases of (PORTER) .. .. *Wright* 827
Treatment, Dictionary of (WHITLA) *Bailliere* 807
Treatment, An Index of (HUTCHISON & COLLIER) *Wright* 827
Treatment, System of (LATHAM & ENGLISH) *Churchill* 821
Tropical Diseases (MANSON) *Cassell* 819
Tropical Medicine (DANIELS) *Butterworth* lxiii
Tropics, Surface Waters in (CLEMESHA) *Thacker* 824
Tuberculin, Rules for Use of (BENNETT) *Wright* 814
Tuberculosis, Lectures to Nurses (BRUCE) *Lewis* 817
Tuberculosis, Treatment of (LAIRD) *Wright* 814
Tuberculosis, Treatment of (ROBIN) *Churchill* 821
Tuberculosis and Lupus (MINCHIN) *Bailliere* 807
Tumours (BLAND-SUTTON) *Cassell* 819
Tumours (HERTZLER) .. *Churchill* 821

Urgent Surgery (LEJARS—DICKIE) *Wright* 826
Urinary Surgery (KIDD) .. *Longmans* 813
Urine in Health and Disease (HEWAT) *Livingstone* 822

Urology (GUITERAS) *Butterworth* lxii

Vaccine Therapy (ALLEN) .. .. *Lewis* 817
Varicocele (BENNETT) .. *Longmans* 809
Varicose Veins (BENNETT) *Longmans* 809
Varix (BENNETT) .. .. *Longmans* 809
Venereal Disease (MARSHALL) *Wright* 814

Waters and Water Supplies (THRESH) *Churchill* 820
What are We? (SUTTON) 812
Women, Diseases of (HERMAN & MAXWELL) *Cassell* 819
Women, Diseases of (LEWERS) .. *Lewis* 816
Wound Treatment (BEATSON) *Livingstone* 822

PERIODICALS

Bacteriology, Protozoology and General Parasitology, Review of 836
Birmingham Medical Review .. .. *Percival Jones* 838
Bristol Medico-Chirurgical Journal .. .. *Arrowsmith* 839
British Journal of Surgery .. .. *Wright* 833
British Journal of Tuberculosis .. . . *Bailliere* 841
Hospital, The .. .. *Scientific Press* 835
Indian Journal of Medical Research .. .. *Thacker* 824
Indian Medical Gazette .. .. *Thacker* 824
International Clinics .. .. *Butterworth* lxiii
Lancet, The .. .. *Lancet Offices* 831
Laryngology, Rhinology and Otology, Journal of .. .. .. *Adlard & Son* 834
Medical Directory .. .. *Churchill* 820
Medical Directory of Australia, New Zealand, Tasmania, etc. (LOXTON'S) *Butterworth* lxii
Medical Officer, The 836
Medical Press and Circular .. .. *Bailliere* 832
Practitioner, The.. .. .. *Practitioner Ltd.* 830
Prescriber, The 806
Therapist, The .. .. *Henderson & Spalding* 840
Tropical Medicine and Hygiene, Journal of .. .. *Butterworth* lxiii
Tuberculosis Year Book and Sanatoria Annual . .. .. *Butterworth* lxiii
Universal Medical Record.. 837
Who's Who in Science .. .. *Churchill* 821

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GLOSSARY

Containing most of the newer terms in this and recent volumes. Additions will be made annually.

Acapnia. — A state characterized by shortage of carbon dioxide in the blood. It is held by Yandell Henderson and others that this is a predominant factor in the production of shock.

Achlorhydria.—Absence of hydrochloric acid from the gastric secretions.

Activator.—A physical or chemical agent which renders active some other chemical agent. In medicine the term is applied almost exclusively to biochemical reactions.

Agglutinin.—A substance which has the power of agglutinating such cells as bacteria or red blood corpuscles. This power is usually specific, i.e., for each kind of cell there is a specific agglutinin, a principle utilized in the Widal test for typhoid fever. In **iso-agglutination** the reaction is wider, the agglutinin proving more or less active with all bacteria belonging to a certain group.

Allergy.—The altered reactivity of an infected animal or person to a second infection with the same poison.

Amboceptor.—A substance which has the specific power of binding complement (q.v.) to the cell (or bacterium) for which it (the amboceptor) is specific.

Amino-acids.— An organic acid in which one of the hydrogen atoms of the base is replaced by NH_2.

Anaphylaxis.—A specific susceptibility which may be manifested by an animal or person in response to a second injection of an organic substance the first injection of which was followed by no toxic results. The animal showing such acquisition of susceptibility is said to have become **sensitized** to that particular substance (see also **Allergy**).

Anisocytosis.— An inequality in size of the red blood corpuscles.

Anoci-association.—This word embodies the prevention of surgical shock as it is conceived by Crile, who teaches that shock is the result of expenditure of nervous energy under the influence of abnormal stimuli. According to him, shock is to be prevented by guarding the brain from such stimuli, by "blocking" of nerve trunks in the area of operation, by preventing all possible sources of mental perturbation, etc. This process of cutting out deleterious stimuli is "anoci-association."

Antiformin. — A solution containing several alkaline compounds which is used in the laboratory for the separation of tubercle bacilli from pathological products (sputum, urine, etc.) which contain them.

Antigen.— Extract of bacteria or of tissue used in that class of serum tests of which the Wassermann reaction is the chief, and which is based on the "fixation of complement" process. The complement (q.v.) is "fixed" by the union of the antibody or amboceptor (q.v.), to which it is attached, with the antigen, i.e., to the extract of bacteria or tissue for which that amboceptor is specific.

Autogenous. — As applied to bacterial vaccines, this adjective denotes those vaccines which are made from the patient's own micro-organisms, as opposed to "stock" vaccines, which are made from standard cultures.

Azoturic. — Pertaining to the urinary excretion of nitrogen.

Bacteriolytic. — That which dissolves bacteria.

Carcinolytic.—That which is destructive to cancer cells.

Chromaffin.—A hybrid word used as an adjective in connection with cells or tissues which display an affinity for chrome salts. Thus the "chromaffin system" is composed of tissues which possess cells having this property; its components are the adrenal and other ductless glands, and parts of the sympathetic system.

Coliform.—An adjective denoting those micro-organisms which resemble B. coli communis.

Complement. — A substance present in blood serum, possibly of ferment nature, which, when linked by an amboceptor to a cell, constitutes with that amboceptor an agent capable of acting upon the cell. "The cell is the lock, the amboceptor the key, and the complement the hand that turns the key."

Cryoscopy.—Determination of the freezing point.

Diadokokinesis.—The performance of a rapid succession of alternating movements, e.g., pronation and supination.

Epinephrin.—One of the various names used to denote the active principle of the suprarenal gland.

Glycyl-Tryptophane.—A compound of glycin and tryptophane radicles, used for a test in examination of gastric contents.

Hæmodynamic.—Relating to the movements involved in the circulation of the blood.

Hæmolysin.—A substance possessing the power of dissolving red blood corpuscles and liberating their hæmoglobin: if possessing this property in regard to the corpuscles of all animals of a certain group or species it is called an **isohæmolysin.**

Herpetomonas.—A species of protozoon.

Heterogenous Vaccines are those prepared from organisms derived from some source other than the patient in whose treatment they are to be used; in such conditions the source is usually a "stock" culture.

Hyperchlorhydria.—Excessive secretion of hydrochloric acid by the stomach.

Hyperpiesis.—Abnormally high arterial tension.

Hypertonic.—As applied to saline solutions, the adjective denotes those which contain a higher percentage of salt than normal human blood serum.

Iontophoresis.—The introduction of ions into the body by the electric current, for therapeutic purposes.

Leucopoiesis.—The formation of leucocytes.

Lipoclastic.—Fat-splitting.

Lipoids are substances such as lecithin which enter into the formation of living cells, and which are like fats in their solubility in organic solvents such as alcohol and ether. These solvents can therefore be used for their extraction from the tissues.

Lipoproteins are combinations of protein with fatty acids.

Lymphopenia.—Deficiency of lymphocytes.

Meiostagmin Reaction.—A test used in the diagnosis of cancer, based on the estimation of interaction between antigen and antibody by measurement of the surface tension of a mixture of the two.

Metreurynter.—An instrument for artificial dilatation of the uterine cavity, e.g., of Champetier de Ribes' bag.

Microtia.—Congenital smallness of the ear.

Neurotropic.—That which "turns towards" (i.e., has a chemical affinity for) nervous tissue.

Opotherapy.—The use of extracts of normal animal tissues as therapeutic agents.

Opsonic Index.—The ratio between the amount of "opsonin" against a certain micro-organism contained in the blood of a person infected wth that organism as compared with the content of similar "opsonin" in a normal blood. "**Opsonins**" are substances contained within the blood serum which have the property of rendering micro-organisms fit for attack and ingestion by phagocytes.

Phlebotomus Fever.—A three-day fever met with in the countries around the Mediterranean, also in India, conveyed by sand flies.

Phosphatids are lipoid substances which are esters of orthophosphoric acid.

Pleocytosis.—Increase of cells (lymphocytes) in the cerebrospinal fluid.

Pleomorphic.—Varying in form (applied to bacteria).

Poikilocytosis.—Variation in the shape of the red blood corpuscles.

Polychromatophilia.—Variability in the staining affinities of the red blood corpuscles.

Polynucleosis.—Polymorphonuclear leucocytosis.

Polypeptide.—Peptones are compounds formed by the union of two or more aminoacids; polypeptides are formed by the union of more than three amino-acids.

Polyvalent Sera are those which contain antibodies active against many strains of the same micro-organism.

Pyelography.—X-ray photography of the renal pelvis after injection through the ureter of some opaque substance such as collargol.

Sensitization.—See Anaphylaxis (above).

Spirillicide.—That destroys spirilla or spirochætes.

Sporogeny.—Reproduction by spores, and especially sporulation after fertilization.

Thyrotoxæmia.—Poisoning by thyroid secretion.

Trophœdema.—Persistent œdema of the lower limbs; usually applied to Milroy's disease, a hereditary condition characterized by this type of œdema.

Trypanocidal.—That destroys trypanosomes.

THE MEDICAL ANNUAL

Part I.—The Dictionary of Materia Medica and Therapeutics.

REVIEW OF THERAPEUTIC PROGRESS, 1913.

BY

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GENERAL REVIEW.

There is no striking advance to be recorded during the period under review. A good deal of work has been done by American workers in the investigation of pharmacopœial drugs, but the general result has been unsatisfactory. The therapeutic value of camphor, aconite, and sumbul is questioned. The interest in salvarsan and neosalvarsan is gradually ceasing, and apparently the profession is beginning to recover faith in mercury. Lactic acid therapy is out of favour, and even vaccine therapy is less in evidence than in former years.

DICTIONARY OF REMEDIES.

ACITRIN.

This new preparation is the ethyl ester of phenylcinchoninic acid, which has been extensively used, under the name of atophan, to increase the urinary output of uric acid. According to Pietrulla,[1] acitrin has a similar action. In normal individuals it causes a rapid increase in the output of uric acid, which, after continued administration, gradually falls to normal and then becomes somewhat irregular. A similar increase is obtained in **Gouty** individuals, and here the excretion may remain for several weeks above the normal value. Accompanying this increased output of uric acid there is improvement in the joint condition and diminution in pain.

Reference.—[1]*Deut. med. Woch.* 1913, 359.

ACONITE.

Rudolf and Cole[1] have tested the effect of tincture of aconite in the pulse-rate in health and disease, and found that in pharmacopœial doses no slowing action was produced. They conclude that the drug is in most cases inert. All the commercial tinctures failed to give the characteristic tingling of the tongue when diluted 1–35. Even a special tincture physiologically assayed and guaranteed to be of B.P. strength gave negative results as regards the pulse-rate, and when tested three months later was found to be very weak. Crystalline aconitine, which was very toxic for guinea-pigs, failed to slow the pulse when diluted so as to correspond to the B.P. tincture. It gave at first the characteristic tingling when diluted 1–35, but after four months the dilution had to be four times less, which appears to indicate that aconitine rapidly deteriorates in solutions.

Reference.—[1]*Amer. Jour. Med. Sci.* 1912, ii, 768.

ADIGAN. (See Digitalis.)

ADRENALIN.

According to Hess and Wiesel,[1] the intravenous administration of adrenalin is of value in the nephritis experimentally produced in rabbits by the intraperitoneal injection of uranium nitrate. Provided the adrenalin is administered before the onset of the terminal anuria, it produces a distinct diuretic effect and a diminution in the albuminuria. Apparently the effect is chiefly a functional one, as the histological changes are not prevented.

Jona[2] suggests the use of adrenalin to constrict the vessels in the stomach and duodenum, thereby delaying the absorption of **Non-corrosive Poisons.** Experiments on rabbits show that this treatment is useful in cyanide poisoning, as it delays the onset of the toxic symptoms for some minutes, during which the stomach may be washed out and antidotes applied. In rabbits which have been given a fatal dose of cyanide, recovery takes place if 3 c.c. of 1–10,000 are introduced into the stomach within five minutes, and the chemical antidote given, or the stomach washed out, within the next four minutes, a little more adrenalin being then given to delay the absorption of any of the poison which may have escaped. For human beings he calculates that 3 oz. of 1–10,000 adrenalin solution would be required. In a few experiments on animals it was found that adrenalin delayed the absorption of strychnine and aconite, and was of use as a procedure preliminary to washing out the stomach.

Meyer[3] finds that adrenalin causes relaxation of the coronary arteries and increased flow of blood through them.

References.—[1]*Wien. klin. Woch.* 1913, 317; [2]*Brit. Med. Jour.* 1913, i, 271; [3]*Berl. klin. Woch.* 1913, 920.

ALEUDRIN.

Aleudrin is the carbamic acid ester of a-a-dichlorisopropyl alcohol. It has a marked sedative action, relieving pain and, in sufficient doses, inducing sleep. It is said that it is not followed by any unpleasant after-effects. As a rule, the patients wake up feeling refreshed and bright. Flamm[1] has applied it with satisfactory results as a hypnotic in a series of patients suffering from **Mental Excitement.** He has never noted any after-disturbance of the gastro-intestinal tract or deleterious action on the cardiovascular system. It does not seem to produce headache, seediness, or depression. He finds it of special value in cases of severe **Depression** and **Anxiety,** as it acts well even in fractional doses, and does not produce cumulative effects. To combat highly excited conditions, he advises the administration of 2 grams. Topp[2] states that 1 to 1·5 gram is required to induce sleep. As a rule, within twenty to thirty minutes, this dose causes a pleasant feeling of fatigue, which is rapidly followed by quiet sleep, lasting from four to seven hours. The drug possesses fairly strong analgesic properties, and is useful in the treatment of **Neuralgia** and the lancinating pains of **Locomotor Ataxia,** both for relieving pain and inducing sleep. Small repeated doses of 0·5 gram thrice daily exert a marked sedative action in **Delirium Tremens,** and are also useful when breaking patients of the **Drug Habit.**

REFERENCES.—[1]*Deut. med. Woch.* 1912, 2311; [2]*Berl. klin. Woch.* 1912, 2230.

ALLYL SULPHIDE.

Minchin[1] states that allyl sulphide penetrates the tissues rapidly and exerts a curative action on **Localized Tuberculous Lesions.** accessible to this form of treatment. He brings forward a number of cases where tuberculous joints with discharging sinuses were rapidly healed by its use.

REFERENCE.—[1]*Med. Press and Circ.* 1913, i, 274.

ANOVARTHYROID SERUM.

Hoffmann discusses the action of serum of sheep from which both ovaries and thyroid gland have been removed. According to his view, the result is that in the serum the antagonizing glands secrete larger quantities than normal. He holds, therefore, that the serum contains, in the first period after the operation, larger outpourings from the suprarenal glands and pancreas, and probably also from the hypophysis. At a later stage, when the compensatory hyperactivity of a gland acting similarly to those removed is established, the serum probably contains less of the antagonizing glands. He thinks, therefore, that it should be gathered soon after the operation. The serum has this advantage over adrenalin, that it represents the secretion of hypertrophied suprarenal glands, whereas adrenalin is an extract. Anovarthyroid serum has been used with success in a case of **Osteomalacia,** in nine injections of 10 c.c. at intervals of three to six days. Hoffmann considers it possible that it might also prove useful in **Rickets,** in the **Psychoses of Puberty,** and in **Hay Fever.**

REFERENCE.—*Münch. med. Woch.* 1913, 693.

ARSENITE OF SILVER.

Rind[1] publishes a preliminary note on the use of this inorganic preparation, which he thinks is likely to prove of therapeutic value.

The salt is soluble in solution of rhodan and thiosulphates, forming labile double salts which are not affected by alkalies or inorganic acids. The salt cannot be injected, as it produces great pain and local reaction but by the mouth it is relatively unirritating, and can be given in considerable quantities for long periods without toxic manifestations. Though hitherto he has not detected any specific action on any disease Rind states that it seems to stimulate the general vitality and power of resisting disease. He has seen surprising results in cases of **Infectious Diseases** and in **Metabolic Disorders.**

REFERENCE.—[1]*Wien. klin. Woch.* 1913, 1028.

ATOPHAN.

Phillips[1] states that this drug often produces skin rashes, resembling those seen following the administration of antipyrin. He records cases where petechial, urticarial, and scarlatiniform eruptions followed its use. On ceasing to administer the drug, the rashes disappeared in a few days, and as a rule recurred in a few days after it was resumed.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1913, ii, 1040.

BLOOD, TRANSFUSION OF.

Weber[1] states that intravenous injection of small quantities of defibrinated human blood exerts a favourable influence on the course of **Severe Anæmia.** The procedure is simple and apparently without risk. It is safer than large transfusion. In the past four years he has given the injections forty-six times in eighteen cases. From healthy individuals 20 to 30 c.c. of blood are removed under aseptic conditions into a sterile Erlenmeyer flask and defibrinated for five minutes by gently stirring with a sterile glass rod. After filtration through four layers of sterile gauze, the defibrinated blood is put into the ice-chest for twenty-four hours. This procedure diminishes the reaction, as the fibrin ferment is probably destroyed. Before injecting the blood, it is thoroughly shaken up and brought approximately to blood-heat by immersion of the flask in hot water. Five c.c. are then injected slowly into the cubital vein. In forty out of his forty-six injections no reaction developed, but in the other four cases there was slight disturbance, usually with slight fever, redness of the face, and occasionally shiverings or rigors. The histories of the cases show that in most the injection of the small quantity of defibrinated human blood stimulated the bone-marrow and caused improvement of the blood picture. The chief change is an increase in the hæmoglobin value and in the number of the red corpuscles. In most cases the injection was repeated at intervals of ten to fourteen days.

REFERENCE.—[1]*Münch. med. Woch.* 1913, [illegible].

BORCHOLIN.

Mehler and Ascher[1] have used borcholin, a relatively non-toxic preparation of cholin in **Tuberculosis.** Cholin and neurin exert an action on the fatty envelope of the tubercle bacillus. With a 25 per cent solution of neurin the bacteriolysis is very rapid and in vitro can be demonstrated macroscopically within one minute. With cholin the process is slower, but apparently more thorough, since not only are the granules dissolved, but also the albuminous substances. Injected subcutaneously, cholin preparations produce an action resembling that of *x*-rays on the skin. After a latent period of several days, an obstinate dermatitis develops; but if it is injected slowly into the blood-stream it produces little disturbance. Too rapid injection, an excessive dose, or a decomposing preparation (smelling of trimethylamine) produces a well-marked cholin reaction, with redness of the face, giddiness, palpitation, transient dyspnœa, marked salivation, and tear-formation. These symptoms pass off in a couple of minutes. The authors use a 1 per cent solution of borcholin in 0·7 per cent sodium chloride, which must be carefully injected into the vein, as infiltration into the subcutaneous tissue is apt to cause trouble. As a rule the initial dose was 1 c.c. of the solution (·01 gram borcholin), but this can be gradually increased every second day till ·25 gram is reached. More than this should not be given as a single dose. The theoretical foundation of this method of treating tubercle is that in the body cholin is formed from the borcholin, and dissolves the tubercle bacilli, thereby destroying them in situ and producing a cure. The authors have tested this method in a series of fifty cases, mostly surgical. The treatment produces an increased serous secretion; the wounds become covered with healthy granulations, and heal rapidly without formation of sinuses. At the same time the general condition improves, the appetite becomes greater, weight increases, and sleep is sounder. The general improvement also occurs in pulmonary tuberculosis, and is accompanied by a diminution or disappearance of bacilli in the sputum. Even after a few injections, with Ziehl's staining the bacilli appear as a row of granules. Generally speaking, they found that the more torpid the tuberculous process, the less the reaction after an injection. In florid cases of pulmonary tuberculosis the initial doses must be small and carefully controlled, as there is no doubt that in such cases a febrile reaction is produced. The few cases reported in detail show that, in some, extraordinary improvement followed the treatment.

REFERENCE.—[1]*Münch. med. Woch.* 1913, 748.

CAFFEINE.

Pal[1] seems to have discovered a new pharmacological action of caffeine. He finds that in guinea-pigs it promptly relieves the **Bronchial Spasm** produced by peptone, β-imidoazolylethylamine, and muscarine. This action, he states, is due to a peripheral stimulation of certain branches of the sympathetic.

REFERENCE.—[1]*Deut. med. Woch.* 1912, 1774.

CAMPHOR.

Heard and Brooks,[1] from a chemical investigation of its therapeutic value, came to the conclusion that the hypodermic injection of camphor in oil in doses up to 50 gr. is not of any clinical value as a cardiac stimulant. Though in laboratory experiments it has occasionally the power of removing artificially produced auricular fibrillation, it has no apparent action on the auricular fibrillation of disease. They think that the drug is rapidly changed into the inert glycuronic acid compound.

Leo[2] has an interesting paper on watery solutions of camphor. He finds that saturated Ringer's solutions take up 1–500 of camphor. Heat throws it out of solution, so that a heated solution contains less camphor than a cold one. The activity of a watery solution is much greater than that of an oily one. It is more rapidly induced, and with a much smaller quantity of camphor. Investigations on animals infected with pneumococci indicate that camphor has a specific action against the organisms.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* 1913, i, 238; [2]*Deut. med. Woch.* 1913, 591.

CARBENZYME.

Stricker and Rubaschow[1] state that carbenzyme is a sterile preparation. It can be given as a soda or glycerin suspension. Normal tissue is not attacked, with the exception of fatty tissue, which is sometimes digested. The digesting action of carbenzyme is chiefly exerted on disorganized dead tissue and on the contents of cysts. Its introduction is only followed by a sharp reaction when it is injected into acutely inflamed structures or into a local lesion where there is great tension. Under other conditions its use is followed by practically no reaction. After the injection of carbenzyme tuberculous pus becomes more fluid, serous and darker in colour. Its use is indicated in **Necrosis** of tissue, **Cold Abscesses, Softening Glands,** and **Tuberculous Hygroma.** In **Glands** the contents are rendered more fluid, but the connective tissue remains.

REFERENCE.—[1]*Berl. klin. Woch.* 1913, [illegible].

CHLORMETACRESOL.

When investigating the properties of a series of phenol derivatives, Laubenheimer discovered that chlormetacresol was an extremely active **Antiseptic.** To render it freely miscible with water in all proportions, it is emulsified with sodium ricinoleate, and under the trade name of "phobrol" a 50 per cent solution has been put upon the market. Kendring[1] has tested this preparation clinically, and finds that a 1 per cent solution in 70 per cent alcohol is a satisfactory solution for rapidly sterilizing the hands and skin. This solution is odourless and leaves the skin soft and supple. It is suitable for long operations where the hands require to be cleansed from blood occasionally, which can be done by wiping with this solution. For short operations where this is not likely to be required, a solution containing one part of phobrol in twenty parts of acetone and seventy-nine parts of 70 per cent alcohol may be used, but if this solution is used during the operation it will fix the colouring matter of the blood for several days. The technique for disinfecting the hands consists in washing for three minutes in soap and hot water, cleaning nails, drying with sterile towel, and then carefully and thoroughly rubbing hands and forearms with the phobrol solution for five minutes.

REFERENCE.—[1] *Deut. med. Woch.* 1913, 513.

COPPER.

Cummins[1] recommends the use of copper preparations in the treatment of **Diarrhœa** and **Choleraic Diseases.** He finds copper sulphocarbolate the best form. He gives $\frac{1}{24}$ gr. in watery solution every hour, and claims that the therapeutic results in intestinal disorders are excellent.

REFERENCE.—[1] *Prescriber,* 1913, May.

COPPER, COLLOIDAL.

Encouraged by numerous favourable reports in foreign medical journals on the use of colloidal copper in **Cancer** cases, Herschell and Cowen[1] have been using it similarly. Though their records are confessedly incomplete, they feel warranted in stating that in the majority of malignant cases definite effects are seen. It diminishes pain in a remarkable manner ; in many cases the tumours retrogress ; hæmorrhage diminishes ; appetite and strength return. The treatment undoubtedly does good, and appears to be quite harmless. The injections should be made intramuscularly, at first every four days, unless any reaction in the tumour takes place, when the interval should be slightly increased. The contents of one ampoule form a single dose. If any pain is produced at the site of injection, a hot compress may be applied, but as a rule the pain is slight and passes off in a few minutes.

H. Chabanier, Rollin, and E. Chabanier[2] have studied the effect of colloidal copper on the blood of a healthy man and two rabbits. In the man, the subcutaneous injection of 5 c.c. produced a diminution in the hæmoglobin for four days. The total number of leucocytes fell for the first two days and then were greatly increased, the rise lasting for two days and then gradually falling to normal. The increase was chiefly in the polynuclear cells, the lymphocytosis being smaller. The eosinophile cells remain unchanged. The immediate effect of the injection, in rabbits and man, is to diminish both polynuclears and lymphocytes, but after the third day a distinct rise is obtained ; and whereas the polynuclear count soon falls again, the lymphocytic rise is more persistent, lasting (in the case of the rabbits) for several days. The large mononuclears also show a slight but steady increase.

REFERENCES.—[1] *Med. Press and Circ.* 1913, i, 387 ; [2] *Presse Méd.* 1913, 102

COTTON-SEED EXTRACT.

White[1] used lactagol, an extract of cotton seeds from which the oil has been removed, with great success in the case of a mother nursing triplets. The **Flow of Milk** was so great that the infants were entirely breast-fed for seven months.

REFERENCE.—[1] *Pract.* 1913, ii, 422.

DIGITALIS.

Hatcher[1] publishes experiments which seem to justify his conclusion that strophanthin and digitoxin rapidly disappear from the blood-stream after intravenous injection. He could, however, find no evidence of the rapid destruction or fixation of these bodies in the tissues. Their removal seems to be chiefly a matter of diffusion. He could find no evidence of them being specially stored up in one tissue more than another.

Eggleston[2] points out that digitalis is very slowly eliminated from the tissues, and that even after all clinical signs of its action have disappeared it may still be present in considerable amounts. He terms this the period of latent action. By administering a second course of digitalis to patients who had exhibited toxic manifestations under a previous course, he is able to show that the return of the toxic manifestations is produced in the second instance by a much smaller quantity of the drug. From this he concludes that it is still present in the tissues in an active form even after all clinical manifestations of its presence have ceased.

Eggleston and Hatcher[3] believe that the nauseant and emetic effect of digitalis bodies is due to an action on the vomiting centre, and from their comparative investigations of various galenical and proprietary preparations of digitalis they conclude there is no proof of the contention that digalen, digipuratum, digitalysatum, or the fat-free tincture of strophanthus are less actively nauseant or emetic in proportion to their cardiac activity than any of the better known and less expensive galenical preparations of digitalis and strophanthus.

Frankel and Kuschbaum[4] claim to have discovered a method of removing toxic saponin bodies from digitalis preparations by precipitating them with cholesterin. They state that in this way they can entirely remove digitonin, leaving the active bodies which produce the digitalis action. This preparation, *adigan*, is said to be free from toxic gastro-intestinal effects.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1913, ii, 386; [2]*Ibid.* 1912, ii, 1392; [3]*Ibid.* 1913, i, 499; [4]*Wien. klin. Woch.* 1913, 669.

DIORADIN.

After an experience of fifteen months of dioradin, Stoney[1] believes that it is of considerable value in **Surgical Tuberculosis.** It is not a certain cure, but in some cases its use is followed by more rapid and certain cure than any other method he knows. Early joint cases recover more rapidly and surely with dioradin injections; more advanced cases, with suppuration, usually heal rapidly if injections are started before or at the time the abscess is opened. In cases with septic infection the injections reduce temperature, improve appetite and weight, diminish discharge, and in some cases effect a cure. They can be given either subcutaneously or intramuscularly, and produce no pain, local reaction, or constitutional disturbance.

REFERENCE.—[1]*Brit. Med. Jour.* 1913, i, 277.

DIPLOSAL.

Diplosal, salicylo-salicylic acid $(OH.C_6H_4COO.C_6H_4COOH)$ is formed by the condensation of two molecules of salicylic acid, forming the salicylic ester of salicylic acid. It is claimed that it is less toxic than salicylic acid, but MacLachlan[1] found that with a much smaller dosage it produces the same clinical signs of toxic action as other salicylates. Hanzlik[2] finds that diplosal is about twice as efficient as sodium salicylate, but is also twice as toxic, though the salicylic acid content of sodium salicylate is 85·6 per cent and that of diplosal 106·2 per cent.

Reference.—[1] *Jour. Amer. Med. Assoc.* 1913, ii, 110; [2] *Ibid.* 1913, 959.

EMMENAGOGUE OILS.

Macht[1] has studied the effect of direct application of various volatile oils popularly used as emmenagogues and abortifacients, and finds that they have no direct stimulating action on the uterine contraction or toxicity, but inhibit or paralyze the contractions of the surviving uterus. On the other hand, many of them are active poisons. The oils tested were oils of rue, savin, pennyroyal, tansy, turpentine, thyme, and apiol. They have all little if any therapeutic value as emmenagogues, and should be deleted from the pharmacopœia.

Reference.—[1] *Jour. Amer. Med. Assoc.* 1913, ii, 105.

ERGOT.

The cock's-comb test is used as a qualitative estimate of the activity of ergot preparations, but an analysis by Crawford and Crawford[1] shows that only one of the many bodies isolated from ergot readily produces blueing of the comb. Tyramine (para-hydroxyphenylethylamine) does not produce it. Isoamylamine hydrochloride was also negative, and ergotoxin produces only slight blueing. Further, the addition of tyramine does not intensify the action of ergotoxin. On the other hand, beta-iminazolylethylamine rapidly produces blueing, with fall of the blood-pressure. Paraldehyde, which also dilates the vessels in cocks, produces blueing of the comb. Consequently it appears likely that the blueing is not due to arterial spasm, since the vasoconstrictors, tyramine, iso-amylamine, will not produce it. In view of these facts it does not seem that the cock's-comb test can be utilized for accurate ergot testing.

Reference.—[1] *Jour. Amer. Med. Assoc.* 1913, ii, 19.

ERYSTYPTICIN.

This combination of secacornin, hydrastinine, and hydrastis extract is stated to possess valuable properties in checking **Uterine Hæmorrhages.** It is usually administered in doses of 20 drops thrice daily. It is stated to contain in each c.c. ·008 gram hydrastinin hydrochloride, ·006 gram hydrastis alkaloids, and 0·8 gram liquid extract ergot. Kiebel[1] reports favourably of its use in **Excessive Menstrual Bleeding** and in the treatment of **Abortions.**

Reference.—[1] *Deut. med. Woch.* 1913, 269.

FORMALDEHYDE.

Gross and Barthelémy[1] draw attention to the value of formaldehyde as a **Disinfectant.** Exposure for forty-eight hours to its vapour effectually sterilizes rubber gloves, linen thread, dressings, and instruments. Porous articles absorb the vapour and remain sterile even after the formaldehyde has evaporated. It does not destroy the tissues or rust metallic instruments. For practical purposes it is best to use powdered trioxymethylene, which liberates formaldehyde in the cold. The powder is irritating to the tissues, so that it is necessary to prevent it coming in contact with the objects to be sterilized. This can be done conveniently by the use of an autoclave, with shelves or trays on which the instruments can be placed. A thin layer of the powder is spread on the bottom of the autoclave and covered with a layer of gauze. Heating is not necessary, provided that the receptacle can be kept hermetically sealed for forty-eight hours. For rapid sterilizing, heat can be used. In this case the powder is not placed directly on the bottom of the receptacle, but on the lowest shelf, so that the heat may not displace it. To prevent instruments rusting they should be heated for a short time before the powder is introduced so that they may be quite dry. Only a low temperature is required to liberate the fumes, as above 55° C. the formaldehyde vapour begins to be less active. After the internal temperature has reached this point the heat should be turned off, and in half an hour sterilization will be complete. Rubber articles should if possible be sterilized without heat. Two sets of gloves are recommended. When new they are used for aseptic operations. After an aseptic operation the glove is carefully soaped on both sides, washed in boiled water, drained, turned inside out, and dried. A piece of cotton wool is then put inside to keep the glove open and ensure that the vapour penetrates. Infected gloves are soaped, put into a 1 per cent solution of sodium carbonate for twenty minutes, washed in boiled water, or, if seriously contaminated, boiled for five minutes, dried, and formalinized. Catheters, immediately after use, are cleaned both inside and outside with soapy water, and carefully dried before formalinizing. If the calibre is very small, or the urine was very purulent, it is necessary to boil them for five minutes. Formaldehyde sterilization is the ideal method of preparing all kinds of ligatures and surgical dressings, as porous bodies absorb the vapour and remain impregnated for some time after removal from it.

Burnam's test for free formaldehyde in the urine consists in adding three drops of 0·5 per cent aqueous solution of phenyl-hydrazine hydrochloride, then three drops of a 5 per cent solution of sodium nitro-prusside, then excess of saturated watery solution of sodium hydroxide. Both the hydroxide and urine should be slightly warmer than blood-heat. One part of formaldehyde in 20,000 gives an intense blue colour, gradually changing to green, and in a few minutes to brown. With less than one in 20,000, the first colour is green, then brown. Burnam claims that the test is delicate down to one part in 150,000, but Smith[2] states that a positive reaction cannot be obtained with greater dilutions than 1 40,000. From an examination of the formaldehyde content of healthy urine after hexamethylene administration, he concludes that the liberation of formaldehyde is not due to a specific renal action, but to the presence of acids. It may commence in the kidney and be continued in the bladder. Litmus paper is an unreliable indicator of the acidity of the urine in about 25 per cent of the cases. (*See also* HEXAMETHYLENETETRAMINE.)

The power of the urine to liberate formaldehyde is best indicated by its hydrogen ion content; the greater the acidity the greater the power of liberating formaldehyde. The requisite amount of acidity can be secured in almost every case by administering boric acid or acid phosphate of sodium.

REFERENCES.—[1]*Rev. de Chir.* 1913, i; [2]*Bost. Med. and Surg. Jour.* 1913, i. 713.

GLANDUOVIN (Extractum Ovariale).

Hirsch[1] believes that the oral administration of ovarian preparations is responsible for the unreliable results which are obtained. Consequently he has tested the clinical effects of a preparation specially prepared for him. No details are given of the method of preparation, but it is said to represent the active principle of ovarian tissue. Glanduovin is a clear non-albuminous sterile solution which can be administered subcutaneously without producing any irritation or after-reaction. It has given good results in cases of **Disturbed or Artificial Menopause.** It has no effect upon pain occurring in the interval between menstruation, but acts well in most cases of **Dysmenorrhœa** and **Amenorrhœa** which are due to lessened functioning of the ovaries. As a rule he gave one injection (representing 2 grams of the ovarian tissue) daily till improvement resulted.

REFERENCE.—[1]*Berl. klin. Woch.* 1913, 1810.

GOLD.

Feldt[1] has, on the suggestion of Spiess, attempted to make gold combinations suitable for use in **Tuberculosis.** It is well known that cantharidin salts injected subcutaneously produce an inflammatory reaction in tuberculous diseased areas; hence he has tested a number of combinations of cantharidin and gold, which is relatively non-toxic and yet very potent in inhibiting growth of the tubercle bacilli. The introduction of ethylenediamine in the ortho-position reduced the toxicity of cantharidin 680 times without removing its physiological properties. He then attempted to confer bactericidal properties on the cantharidin compound, which is inert in this respect. With gold he prepared two compounds which proved satisfactory in the curative treatment of rabbits infected with tubercle. These are cantharidin ethylenediamine-auricyanide and -aurichloride. In rabbits, where these drugs can be given intravenously, the dose of ·002 gram per kilo proved non-toxic. In infected tuberculous rabbits such doses prolonged life for several months, with arrest of the progress in the various internal organs and increase in weight. Subcutaneous injections proved less satisfactory, as the drug is readily reduced in the tissues locally and is apt to cause abscess-formation. A possible source of error will be the fact that *in vitro*, gold-resistant strains of tubercle are readily produced, so that probably it will be necessary to use some form of combined treatment.

Reference.—[1]*Deut. Med. Woch.* 1913, 549.

HEXAL.

Hexal (sulphosalicylic acid hexamethylenetetramine) is stated by Baumer[1] to be a useful antiseptic and sedative for the urinary tract. He advocates its use in **Gonorrhœal Infections.** The drug has a pleasant acid taste, and should be given in water in increasing doses. He commences with one tablet three daily, which may be increased to two tablets six times daily if required. It is rapidly excreted, and there is, according to him, no risk of a cumulative action.

Kowanitz[2] states that it is a mild diuretic which rapidly acidifies alkaline urine, exerts a decided sedative action, and acts as a reliable antiseptic. He has used it with success in gonorrhœal and other forms of **Cystitis** and **Urinary Infections.** His average dose was 1 tablet (·5 gram) thrice daily.

References.—[1]*Berl. klin. Woch.* 1913, 1905; [2][illegible] *Woch.* 1913, 16.

HEXAMETHYLENETETRAMINE.—(*See also* Formaldehyde, Urinary Antiseptics.)

Talbot and Sisson,[1] from a study of the urine of children and infants taking urotropin, find that it is often excreted unchanged in alkaline or neutral urine, and is scarcely ever broken down into formaldehyde unless the urine is acid. When the child is secreting an acid urine containing formaldehyde, the administration of sufficient alkali to render the urine alkaline will check its formation. Therefore drugs which alkalinize the urine should not be given along with urotropin. They find that urotropin administration is soon followed by the appearance of formaldehyde in the urine. They have detected it within the second hour, and it has persisted as long as eighteen hours after the last dose. While all children are capable of breaking down urotropin, relatively large doses are often necessary before the excretion of formaldehyde takes place.

Langue[2] advocates the use of large doses of hexamethylenamine to prevent **Post operative Tympanites.** For two days before the operation the patient takes 10 gr. dissolved in a glass of water every two hours between meals while awake. The bowels are cleaned out with a purge or enema before the operation, and afterwards the patient is encouraged to drink water containing 120 gr. of urotropin to the quart. As a rule, it is possible to give the whole quantity in the twelve or twenty-four hours, and for the next two days the nurse is told to see that this amount is given daily. The drug is then stopped. Out of a series of 300 operations of all types, in only four did tympanites develop. A similar treatment is useful in **Catarrhal Jaundice** and in cases of portal infection, e.g., **Colitis, Bile-tract Infection, Duodenitis**.

Pyloric Ulcer. For these conditions about 1 to 2 dr. should be administered daily for the first three days; the drug is then stopped entirely till the bowels are emptied. Any bladder irritation or hæmaturia rapidly subsided on stopping the urotropin.

Leibecke[3] has demonstrated the excretion of urotropin in the pus of **Middle-Ear Disease** and **Peritonitis,** and in **Bronchial** pus. He estimated the amount contained in the various forms of pus, and found that in middle-ear disease the highest concentration was 1-6000 to 1-10,000, which might have some slight antiseptic action. The peritoneal and bronchial pus contained smaller quantities of urotropin, the maximum concentration being 1-15,000 and 1-20,000 respectively. The largest proportions are obtained two to four hours after administration, so that clinically the best plan will be to use doses at intervals of six or seven hours.

References.—[1]*Bost. Med. and Surg. Jour.* 1913, i, 485; [2]*Ther. Gaz.* 1913, 470; [3]*Berl. klin Woch.* 1912, 1698.

HYDRASTININ.

Hydrastinin can be prepared synthetically from piperonal. It appears to have the same pharmacological properties as the natural product, causing contraction of the uterus and increase of blood-pressure. Offergeld and Dührssen[1] find that it equals the action of the more costly fluid extract of hydrastis, and can be successfully employed in controlling **Uterine Hæmorrhages,** in relieving the painful forms of **Dysmenorrhœa,** and in **Excessive Menstruation.**

Reference.—[1]*Berl. klin. Woch.* 1913, 64.

HYDROGEN PEROXIDE.

Heinemann[1] has investigated the germicidal efficacy of commercial preparations of hydrogen peroxide. He finds that they are of considerable value, as they cause an enormous reduction in the number of bacteria, and the decomposition products are harmless. Suspensions of *B. typhosus*, *B. coli*, and *B. prodigiosus* are very sensitive to its action in quantities corresponding to 3, 6, and 12 dr. of a 3 per cent solution of H_2O_2, and to 2, 4, and 8 dr. of a 4·5 per cent solution of H_2O_2 per quart of milk. Suspensions of the same bacteria in water are sensitive to the action of H_2O_2 solutions in quantities corresponding to 3 and 6 dr. of a 3 per cent solution to the gallon, or to 2 and 4 dr. of a 4·5 per cent solution to the gallon of water. These results are accomplished in six hours. Complete destruction is rarely accomplished and cannot be depended upon. For drinking water, 3 dr. of a 3 per cent solution and 2 dr. of a 4·5 per cent solution per gallon of water destroy 99 per cent or more of all bacteria in the course of six hours. For market milk, if fresh preparations of peroxide are used, 6 dr. of a 3 per cent solution and 4 dr. of a 4·5 per cent solution to the gallon of milk will destroy 99 per cent of all bacteria, though absolute sterility is rarely obtained. Unfortunately, commercial preparations are rarely pure, and their efficacy varies with their age and purity, and with the air temperature, so that it is not safe to depend upon them as germicides unless their exact composition at the time of use is known. Heinemann states that commercial peroxide solutions should be reserved for emergency occasions, as owing to their cost, uncertain composition, susceptibility to enzyme and other disturbing factors, they cannot be relied on, and can never compete with efficient water filtration and pasteurization of milk.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 1901.

IODINE.

Madden[1] has found an alcoholic solution of iodine so satisfactory a **Disinfectant** for the skin that he has discarded dressings, though his patients are largely composed of Egyptians, whose skins are the dirtiest that it is possible to imagine. Dalton[1] is also very satisfied with iodine as the sole dressing to clean operation wounds. It is simple, efficacious, and economical, and causes the minimum discomfort to the patient.

REFERENCE.—[1]*Brit. Med. Jour.* 1912, ii, 795.

IRON, COLLOIDAL.

Dumond[1] points out that colloidal iron occurs in two forms, in which the particles are differently charged electrically. That form in which the disperse phase is positive is unsuitable for intravenous or hypodermic injection, as the particles precipitate in contact with the negative particles of the body colloids. Consequently the iron colloid with the negative disperse phase is the better form to employ, as its hypodermic injection is painless, and followed by only a trifling discoloration of the skin. He notes that after the injection the fæces contain more iron. The therapeutic results are excellent, and after hypodermic use the number of red corpuscles and the percentage of hæmoglobin increase rapidly. The iron colloids are antiseptic and astringent in action. Their injection is followed by a slight increase in the relative percentage of polymorphonuclear white cells, with few lobes in the nucleus. This effect is temporary only, and ceases as the case improves. He states that the injections also produce a rise in the opsonic index. There is a subsequent slight fall but no definite negative phase. He thinks that in **Erysipelas** and **Cellulitis** the hypodermic administration of the iron colloids has a marked effect in promoting resolution and shortening the disease.

REFERENCE.—[1]*Lancet,* 1912, ii, [illegible].

KAOLIN.

Liermann's method of **Disinfecting the Skin** by means of an alcoholic paste of kaolin is favourably reported on by Kuester and Geisse[1], and unfavourably by Kutscher.[2] The technique consists in washing the hands in hot water, cleansing the nails, and then washing with 2 to 3 grammes of a special kaolin soap (kaolin, potash soap, glycerin, alcohol). The soap is washed off with sterile water, and the parts are dried with sterile towels. The hands and forearms are moistened with 5 c.c. of 96 per cent alcohol, and then 2 to 3 grams of the kaolin alcohol paste are thoroughly rubbed in, so that the papillary lines stand out white. It is claimed that the kaolin, by its astringent and absorbent properties, seals up the pores and prevents the deeper-lying organisms coming to the surface. At the same time it carries in the alcohol, thus producing a double action. Kutscher, experimenting with this method, found that there was practically no diminution in the number of organisms after the disinfection. On the other hand, Kuester and Giesse claim that in 21 out of 26 experiments the number of germs that survived was less than 5, and in the other experiments less than 20 colonies developed in plates inoculated with fluid agar or saline in which the hands were washed. No other method of sterilizing the hands gave better results.

REFERENCES.—[1]*Deut. med. Woch.* 1912, 1594; [2]*Berl. klin. Woch.* 1912, 620.

LEPTYNOL.

Leptynol is a 2·5 per cent solution of colloidal palladium hydroxide in liquid paraffin. It has been used as a means of reducing **Adiposity.** It is given as an injection deep into the abdominal fat, as it causes a good deal of infiltration and ulceration if it is injected into the subcutaneous tissue. The drug is said to possess marked catalytic properties, and to stimulate the oxidation processes of the body. Properly injected into the abdominal fat, it appears to be rapidly enough absorbed to avoid local irritation. Gorn[1] has used it in twenty-five cases in combination with exercise and strict milk diet, and states that the results were marked. With bi-weekly injections of 50 to 100 mgrams of leptynol he obtained an average loss of 2·7 to 3·4 kilos in the week. Slight degrees of adiposity react least to the treatment. He states that the drug seems to have a stimulating action, and the patients do not object to the treatment.

REFERENCE.—[1]*Münch. med. Woch.* 1913, 1035.

LEUCOCYTE EXTRACT.

Hiss and Dwyer[1] have used this extract in 148 cases of **Erysipelas.** Most of the cases were due to surgical operations, and others were examples of idiopathic erysipelas. Nearly all were severe infections. The results obtained were evidently very good. In fifty-nine cases where the treatment was commenced within three days of the first appearance of the lesion, there were only two deaths, and the average duration of treatment was 2·3 days. Of eighty-nine cases where the treatment was instituted after the third day, three died. The injections seem to be effective even in very young children, as in twelve patients under one year the fatal cases were only four in number. Excluding infants under one year of age, the recovery rate works out at 99·27 per cent. The injections usually cause a fall in temperature and a rapid improvement in the general condition. In practically all the cases, headache, nausea, and vomiting disappeared within a few hours, the mind became clear, and the patient felt comfortable. In cases treated at an early stage the temperature falls sharply and the disease ends by crisis. Where the treatment is instituted later in the disease, the fall of temperature is less marked, but the general condition is improved and the disease is cut short. In all cases, treated either early or late, the burning and aching pain disappears in a few hours. After the injections the rash may still spread, but alters in character. Bright rashes fade, while the dusky purplish rash of the asthenic case changes to a healthier crimson form.

REFERENCE.—*Med. Rec.* 1913, ii, [illegible]

LUMINAL.

In the last issue of the ANNUAL it was pointed out that luminal, the new **Hypnotic** formed by replacing one of the ethyl groups in veronal by a phenyl group, is not a very safe drug. Pernet[1] saw an erythematous rash follow its use and Farnell[2] in two cases after repeated small doses of 0·3 gram, saw fairly severe and prolonged toxic symptoms, with persistent drowsiness, ataxia, and absence of the knee-jerks.

Benedek[3] has tested luminal carefully in a series of over a hundred mental cases in regard to its sedative and hypnotic properties. As a sedative he gives ·3 to ·5 gram subcutaneously several times daily, while for a hypnotic action he uses 0·74 gram hypodermically. Sleep is produced in less than three-quarters of an hour, and the sedative action is usually seen within the first quarter of an hour. The sleep lasts longer than after hyoscine, the usual duration being from five to nine hours. Side actions, in his experience, were seldom seen. In two cases there were cardiac oppression, headache, loss of appetite, and hebetude, and in a third case the sedative action was unduly prolonged during the following day.

REFERENCES.—[1]*Brit. Med. Jour.* 1913, ii, 112; [2]*Jour. Amer. Med. Assoc.* 1913, ii, 192; [3]*Wien. klin. Woch.* 1912, 1571.

MASSAGE.

Phillips[1] calls attention to the value of massage in the treatment of **Malnutrition, Rickets,** and various other disorders in children; **Constipation,** spastic contractions in **Polioencephalitis,** or other conditions where there is destruction of the upper motor neurone. In malnutrition, with loss of appetite, weak flabby muscles and distinct pallor, massage for twenty minutes daily gives excellent results. It is very useful for babies convalescing from acute illness. In rickets it does much to prevent deformities. It assists in overcoming constipation, and is useful in restoring the normal tone to nervous children.

Elmslie[2] advises immediate application of a compression bandage or strapping in **Strains,** with massage to remove effusion, and movement of the joint from the first. In **Acute Arthritis,** gentle massage may aid the absorption of effusion, but movement of the joint tends to increase the pathological changes. After the acute inflammatory symptoms have subsided, movements sufficient to stretch the parts without causing considerable pain may be started. The aim of the treatment is gradually to increase the range of movement until the normal is obtained. If no improvement is manifest in a reasonable time, the joint should be examined under an anæsthetic, which enables us to break down localized adhesions and to determine whether it is still possible to secure additional movement. If, under the anæsthetic, movements are never free, and are only obtained with great difficulty, there is already definite fibrous adhesion and it is usually better to leave a stiff joint. In the treatment of **Fractures** the joints may be moved from the first; not so the fractured ends of the bone. As soon as the deformity is removed, the whole limb from the extremity upwards should be bound up with a firm compression bandage. The proper use for splints is to prevent a recurrence of displacement. Massage and gentle movement of the neighbouring joints may be carried out from the first, provided that the movement does not tend to bring on displacement again. The massage movement is easily carried out by the practitioner. It should be light and almost painless.

Cyriax[3] states that in the treatment of **Backward** or **Mentally Deficient Children** medical gymnastics are useful as a prelude to physical education. The treatment must of course be strictly individualized. Its effect is to develop the latent potentiality of the brain cells. Increase in muscular power goes hand in hand with progress of mental development and improvement in the child's sensory condition. The chief aims of medical gymnastics in cases of mentally deficient children are to aid in developing the efficiency of the motor, sensory, and psychic elements of the cerebrospinal system, the muscular system, the sympathetic system, and generally to improve the constitution. The exercises are passive manipulations, mechanical shaking and strong vibration applied over the brain and spinal cord, and local nerve friction. Auditory and visual stimulation is afforded by telling the child to perform or to imitate movements. Active and passive, or resisted, movement of joints may be associated with the other forms of treatment.

Abercrombie[1] points out that a muscle can be exercised either by contracting (concentric action), thus approximating its two ends; or by strongly resisting a power which is too great for it to overcome completely (excentric action). Physically, an overstretched muscle is in the worst possible position to do work. It is much more likely to do effective work if its two ends are not too far separated. This is often seen in a paretic muscle. In severe wrist-drop the affected muscles may be quite incapable of raising the hand, but are yet capable of some work in preventing the dead drop of the wrist when the hand is passively dorsiflexed. To exercise this power the operator supports the hand, allowing the part to sink gradually while the patient attempts to prevent the fall. This method of treatment must not be done so frequently as to exhaust the muscle: five or ten times at each sitting, which may be given once or twice daily, is sufficient. The movements must be given slowly and carefully, with a strength proportionate to the muscle's power. Excentric treatment gives better results in lower than in upper neurone forms of paresis. Of course, the muscle must still retain some power of contraction, as the method is obviously not feasible in complete paralysis. Generally speaking, however, it is possible wherever other methods of movement are. It takes less time than other methods, and requires no costly apparatus or great training.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* 1913, i, 304; [2]*St. L. Jour.* 1913, April 8; [3]*Med. Press and Circ.* 1913, i, 523; [4]*Brit. Med. Jour.* Feb. 1913, 27.

MERCURY.

Wright[1] reports a further series of cases due to infection with micro-organisms which have been successfully treated with deep intramuscular injections of mercury succinimide. This series represents all types of disease, but the largest group is formed of **B. Coli Infections.** He records numerous cases of this type which responded readily to the injections.

Clarke[2] prefers a 1–500 solution of mercuric perchloride in methylated spirit to iodine as more powerfully antiseptic, non-staining, and less irritating to the skin, so that it can be freely applied to such parts as the scrotum, penis, anus, where iodine cannot be used. On the other hand, the perchloride solution is not irritating, provided that it is allowed to dry quickly and to evaporate.

REFERENCES.—[1]*Med. Rec.* 1913, i, 325; [2]*Brit. Med. Jour.* 1912, ii, 794.

MESBE.

"Mesbé" is the Indian name for *Sida rhombifolia cubilguitziana*, which grows in Central America and is used as a remedy for **Tuberculosis** and **Lupus.** It owes its introduction as a remedy to a German planter, who observed good results follow its administration in these conditions. Mesbé is an extract of the plant. Several observers record successful results from its administration. The first report is by Spangenberg.[1] Heermann[2] saw good results in three cases of tuberculosis of the throat and ear. Jarosch[3] tested the new drug in a series of twelve cases of phthisis, but was not able to detect any evidence that it possesses a specific action. He administered it both internally and locally by means of a spray, and found that there was no increase of weight, improvement of appetite, or diminution of tubercle bacilli in the sputum. In two cases at the end of the treatment there was a severe hæmorrhage. The cuti-reaction did not disappear, nor was there any improvement in the local physical signs or in the x-ray photographs. The chief effect seemed to be as an expectorant, the expectoration being lessened and more easily brought up.

REFERENCES.—[1]*Deutsch. med. Ztg.* 1912, No. 18; [2]*Münch. med. Woch.* 1912, 1879; [3]*Deut. med. Woch.* 1913, 215.

METALS.

Gaylord[1] finds that a curative action is exerted on the infiltrating carcinomatous tumours which grow in the thyroid glands of fish by minute traces of metals dissolved in the water in which they swim. The presence of iodine, arsenic oxide 1-300,000, and perchloride of mercury 1-4,000,000, all produced similar changes in the tumours. Within a couple of days the improvement commences, and within a week there is a definite alteration in appearance and histology amounting to a complete cure. The chief interest of Gaylord's observations is that the fish only require traces, whereas mammals require large doses to cure **Carcinoma**. He thinks that it is not improbable that even in mammals the discovery of a suitable combination of metallic salts may result in a great lessening of the dose.

REFERENCE.—[1]*Berl. klin. Woch.* 1912, 2017.

NEOSALVARSAN.—(*See* SALVARSAN.)

NEUBORNYVAL.

This name is given to the bornyl ester of isovalerylglycolic acid. It contains 53 per cent borneol, 34·5 per cent valerianic acid, and 25·7 per cent glycolic acid, and is obtained by heating chloracetic acid bornyl ester with salts of valerianic acid. After purification by distillation *in vacuo*, a colourless, almost odourless and tasteless oily liquid is obtained, soluble in spirits of wine, ether, benzol, and fatty acids, but insoluble in water. It is not acted on by the gastric juice, but in the presence of the alkaline intestinal juices is split up into borneol, valerianic acid, and glycolic acid. It does not cause unpleasant eructations, but is best given after meals. Rigler[1] has used it with excellent results in various **Nervous Conditions** and in **Cardiac Neuroses.**

REFERENCE.—[1]*Münch. med. Woch.* 1913, 240.

NOVIFORM.

This new substitute for iodoform is a compound of bismuth, bromine, and pyrocatechin. It is stated to be less irritating than iodoform, and to act efficiently in lessening secretions. Favourable reports by many surgeons show that it is of value as a dressing for wounds, and recent reports indicate that it is also of service in gynæcological, ophthalmic, and nasal conditions. Patek[1] found that it acted well in **Gynæcological, Operations,** and possesses valuable deodorant and astringent properties. He employed it either as a powder or as impregnated gauze. It does not produce eczematous irritation. Freytag[2] found the powder or a 2 to 10 per cent ointment useful in **Ophthalmic** work, especially in corneal infections, ulcerations, and extraction of foreign bodies. Devoid of odour, it reduces secretion and promotes epithelialization without producing irritation. Dinolt[3] states that gauze impregnated with noviform is of value in **Nasal** work, as it dries up secretions and does not irritate or cause excessive formation of granulation tissue. A further advantage is that tampons do not adhere, and are thus easily and painlessly changed.

This new substitute for iodoform seems to possess some valuable properties. Michaelis[4] notes that it is a good astringent and deodorant. It is readily sterilized, and is not affected by light. Of special value is the fact that it does not form adherent masses in the presence of secretions. Million[2] also praises the drying properties of the drug, which is of great value in the treatment of **Fistulæ.** He found noviform a reliable antiseptic in the treatment of **Septic Wounds.**

REFERENCES.—[1]*Deut. med. Woch.* 1913, 1204; [2]*Berl. klin. Woch.* 1913, 1261; [3]*Ibid.*; [4]*Ibid.* 1912, 1040; [5]*Münch. med. Woch.* 1912, 1852.

OPIUM.

Gay[1] strongly recommends small doses of opium in the treatment of **Gangrene,** and in the premonitory vascular disturbances seen in the lower extremities of elderly people. In such cases the administration of small doses of tincture of opium seems to act beneficially, apparently producing a tonic action and stimulating the circulation, while calming the nervous system. He commences with two or three drops of the tincture night and morning, increasing by one or two drops every four or six days till some improvement is evident, either in relief of pain or in the appearance of the part. As soon as this effect is obtained, the dose is kept stationary, and may be maintained for long periods without harm. Small doses alone are required. Gay has never had to exceed **20 min. in divided doses in the twenty-four hours.**

REFERENCE.—[1]*Ther. Gaz.* 1913, 457.

OXALIC ACID.

Fry,[1] from an analysis of three cases of oxalic acid poisoning, holds that most of the symptoms are really due to precipitation and removal of the calcium salts from the various tissues, and that the general effects are not merely secondary to cardiac depression. To combat them, lime salts should be given from the commencement, not merely to neutralize the free acid in the gastro-intestinal tract, but to restore the salt lost by decalcification. In view of the low absorbability of ordinary lime preparations, it is well to give the lime combined with fats, so that calcium soaps may be formed which are more readily taken up.

REFERENCE.—[1]*Lancet,* 1913, ii, 22.

OXYGEN.

Gross[1] recommends the insufflation of oxygen into the intestine as a disinfectant. A duodenal tube is introduced into the duodenum about 3 cm. past the pylorus when the stomach is empty. The upper end of the tube is then connected directly with the regulator of an ordinary oxygen jar, and the gas allowed to enter slowly. When the patient complains of distention the flow is stopped temporarily. As a rule the administration is kept up in this way for an hour to an hour and a half. For the first week it is given once daily, and for the next two weeks every second day; for the fourth week every third day. When there is evidence of serious anatomical change in the large intestine the administration may be made by the rectum. Oxygen insufflation gives both objective and subjective results. Fermentative and putrefactive dyspepsia and catarrh are lessened, and pain and annoying symptoms relieved. Admixture of mucus with the stool is only slowly removed, and is the last symptom to go. The object of the treatment is to inhibit the growth of anaerobic pathogenic bacteria, and to allow normal intestinal flora to regain the upper hand. This treatment has given good results in **Chronic Fermentative** and **Putrefactive Catarrhal Typhlitis** and **Colitis.**

Martinet and Heckel[2] employ *hypodermic* injections of oxygen in **Acute Asphyxial Conditions** arising chiefly from toxic or infectious origin—uræmia, diabetes, pulmonary conditions, and tuberculosis. The injection is practically painless, and is best made into the outer aspect of the thigh. In chronic cases an injection of 300 to 750 c.c. is given once or twice a week; but in acute cases they may be repeated frequently, and several litres be given daily. The injection should be made slowly, from five to twenty minutes being devoted to the introduction of each half-litre. As the result of the treatment there is considerable rise in the blood pressure, lowering of the viscosity of the blood, and a corresponding increase in the hæmoglobin. The pulse is softened and the respiratory movements become more ample. Hand in hand with these go an improvement in the general condition, and a feeling of well-being.

REFERENCES.—[1]*Med. Rec.* 1912, ii, 986; [2]*Presse Méd.* 1913, 241.

OZONE.

The claim has often been advanced that ozone is of value as a gaseous disinfectant, and several manufacturers have constructed machines for developing it, for which the general claim is made that microorganisms are killed, odour destroyed, and impure air purified. The results of two independent investigations[1], made in America, are strongly against the view that ozone is of practical value in any of these respects. At best it is only a feeble disinfectant, requiring prolonged exposure before it produces its action. On the other hand, in concentrations far below those effective as a disinfectant it is injurious to the human respiratory tract. It is not powerful as a deodorant. If concentrated, the intensive odour of ozone masks most smells but does not destroy them. Thus the ozone may conceal faults in ventilation while not correcting them. As a practical therapeutic agent ozone is of no value.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1913, ii, 1007, 1013.

PARACODIN.

This is a hydrated codeine. Dahl[1] finds it a useful drug which acts in somewhat smaller doses than codeine. It surpasses codeine in sedative effect, and is a useful drug in cases of **Cough.** In oral doses of 0·025 gram, paracodin tartrate removes irritable cough and produces a sensation of well-being, usually without any after-effect. Occasionally it acts more powerfully than morphine. In seven cases of **Nervous Sleeplessness** it proved a reliable hypnotic. Sometimes unpleasant side-actions are seen, such as vomiting and, in one case, collapse. His general verdict is that paracodin is a valuable addition to our therapeutic resources, which often acts well, and is not more liable to produce unpleasant side-effects than other sedatives.

Apparently it acts more rapidly and is slightly more narcotic than codeine, but, like it, produces no constipation or habit formation. Fraenkel[2] recommends it as a remedy for alleviating cough. He noticed no unpleasant side-action produced by the drug, and Schwartz[3] has also had a similar experience to record.

References.—[1]*Deut. med. Woch.* 1911, 1904; [2]*Münch. med. Woch.* 1911, 522; [3]*Ibid.*

PELLIDOL.

This substance is the diacetyl derivative of amido-azo-toluol. Unlike it and scarlet red, pellidol is colourless and is soluble, so that it can be conveniently made up in ointment form. Eanthin[1] found a 2 per cent ointment of great use in the treatment of **Intertrigo** and **Eczema** of infants, and Hoffa[2] confirms these statements. He says it acts well even in dispensary cases, causing no irritation or other deleterious effect.

References.—[1]*Münch. med. Woch.* 1912, No. [illegible]; [2]*Deut. med. Woch.* 1911, [illegible]

PERMANGANATE OF POTASSIUM.

Barton[1] calls attention to the **Anæsthetizing** effect of potassium permanganate solutions upon the genito-urinary mucous membranes. With solutions of 1–2500 to 1–5000 a transitory anæsthesia of the urethral mucous membrane is produced which permits the painless passage of sounds. After irrigation with 1000 c.c. of a 1–5000 solution, the anæsthesia commenced in two minutes, and lasted about ten minutes. It takes about five minutes to pass off.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1911, i. [illegible]

PICRIC ACID.

Mitchell[1] reports that a 1 per cent solution of picric acid in alcohol has been used by Nitong in 78 cases of **Wounds**, with very satisfactory results. The staining of the skin is very intense and tenacious. It is also necessary to ensure that the edges of the wound are carefully coapted, as the solution has a marked effect in coagulating albumin, so that a pocket of coagulated serum may delay the healing of the wound.

Reference.—[1]*Ann. Surg.* 1912, ii. [illegible]

PITUITARY EXTRACT.

Espeut[1] reports a case of *rupture of the uterus* after administration of pituglandol. The patient had borne seven normal children, but the eighth birth presented difficulties owing to the large size of the infant's head. This was firmly wedged in the pelvis and the os fully dilated, when pituglandol was injected, as the cardiac action of the child was poor and the uterine contractions were feeble and infrequent. The first hypodermic injection of 1·1 c.c. produced no improvement, and a second injection was given after an hour and a half. This produced violent uterine action within five minutes, and resulted in rupture of the uterus. The immediate operation revealed two large lateral rents which involved the whole of the cervix and stretched wide into the parametrium.

Donelan[2] is unable to confirm Citelli's enthusiastic report of the value of pituitrin preparations in the lessening of *bleeding after operations on the throat and nose.* Citelli states that the injection of ½ to 1 c.c. subcutaneously effectually checks hæmorrhage in operations on the turbinates, nasal polypi, tonsils, and in sinus operations, but Donelan, from his experience in twenty-five similar cases, found that ½ c.c. was practically useless, and 1 c.c. gave little better results as regards bleeding during the operation. In turbinectomies the hæmorrhage was greater with pituitrin than after adrenalin, and during operation on the mastoid antrum the bleeding seemed to be unaffected by pituitrin, though the after-oozing was less than usual.

Musser[3] has studied the effect of prolonged administration of pituitary extract upon the *blood-pressure.* The preparation used was made from the whole gland, and was made up in ·2 gram tablets containing ·065 gram dried gland, equal to ·26 gram of the fresh gland. As a rule, four tablets daily were required to produce any effect. The administration lasted from one week to ten months. In 17 out of 18 cases a rise in systolic blood-pressure was obtained, the greatest rise being 28 mm. Hg The diastolic pressure usually increased correspondingly, but occasionally remained unaffected. The pulse-rate was usually increased, but in two cases it decreased. Glycosuria was never seen, but a diuretic effect was noted in six individuals. The intestinal functions were stimulated. Diarrhœa was noted in seven cases, and four, previously costive, had daily movements while taking the drug. He concludes that the pressor effect was the most constant; and it persisted for an appreciable time after stopping the administration.

Houssay and Beruti[4] speak very highly of the marked action of extracts of the posterior lobe of the pituitary gland upon the *intestinal contractions.* They employ a solution containing in 1 c.c. the active principles of 20 cgrams of the posterior lobe of the ox. This solution can be injected subcutaneously without causing pain. To produce evacuation of the bowels they found that 3 c.c. is the average dose required. The effect is very prompt. Within two or three minutes intestinal movements are felt, and at any period from six to sixty minutes the bowels act. It appears that the first effect produced is inhibition of the intestinal movements, which is soon followed by contractions, increasing in strength. The action is almost always painless, but the patient usually becomes pale, and the pulse-rate increases with the peristalsis. Occasionally the patient vomits. The evacuation is sometimes repeated within twenty-four hours, but the action passes off entirely within forty-eight hours. Clinically the authors have found the drug very useful in **Intestinal Paresis after Operation** and in **Tympanites.** The chief advantages are the rapidity and certainty with which it acts.

Popielski[5] holds that there are two bodies in the gland, one of which is pressor in action and the other depressor. Pituitrin and pituglandol contain the former, and hypophysin the latter principle. The pressor substance can be obtained in a relatively pure condition by precipitating it with phosphotungstic acid, which leaves the pressor substance in the solution. The filtrate is treated with barium hydrate to remove the acid, and then this is removed with sulphuric acid. The solution is then dried and extracted with alcohol. The alcoholic extract is then precipitated with alcohol sublimate.

Houssay[6] finds that the *combination of adrenalin with pituitrin* gives better results than either drug alone. In suitable combination the initial vascular depression induced by pituitrin is lessened, and the subsequent vascular contraction and cardiac stimulation are more efficient. The most suitable proportion is to mix four or five drops of adrenalin solution with 1 c.c. of pituitrin. This mixture may be injected to overcome shock; but the two drugs neutralize each other as regards the intestinal muscles, and the mixture is not suitable for use as a purgative or to relieve paralytic distention of the bowel. On the other hand, the combination of the drugs intensifies their astringent action and makes for a very protracted and efficient vasoconstriction.

REFERENCES.—[1]*Münch. med. Woch.* 1913, 1774; [2]*Jour. Lancet*, 1914, 353; [3]*Amer. Jour. Med. Sci.* 1913, ii, 208; [4]*Presse Méd.* 1913, 613; [5]*Berl. klin. Woch.* 1913, 1156; [6]*Wien. klin. Woch.* 1913, 489.

SALICYLATE OF SODIUM. (*See also* RHEUMATISM.)

The Council of the American Medical Association on Pharmacy and Chemistry have been investigating the properties of synthetic and natural sodium salicylate. The general verdict is that there is no essential difference between the two. Waddell[1] showed that there was no difference in pharmacological action, and Hewlett[2] that the clinical effect is similar, while Hilpert,[3] after investigating the purity of commercial sodium salicylate, comes to the conclusion that the cheapest commercial synthetic form is the equal of the higher priced brands of the synthetic kind or the costly "natural" product. Hanzlik[4] finds that there is no difference in toxicity between the natural and synthetic salicylate and oil of wintergreen, and that age, sex, diseased condition or therapeutic response do not modify the toxic dose.

Levin[5] finds that in the goat the method of administering the drug affects the amount present in the blood-stream and also the rapidity with which the drug is excreted. After subcutaneous injection, the concentration in the blood-stream is less than after intramuscular injection or oral administration, and the drug leaves the blood-stream within ten hours. With intramuscular injection the greatest concentration in the blood-stream is obtained, and the drug is not completely removed for twenty-two hours. Oral administration results in the prolonged presence of the drug in the blood-stream, in which it can still be demonstrated for thirty-two hours. On the other hand, the amount of the drug present at any time is greater than after subcutaneous fut much less than after intramuscular injection.

REFERENCES.—[1]*Arch. Int. Med.* 1911, 784; [2]*Jour. Amer. Med. Assoc.* 1913, ii, 319; [3]*Ibid.* 1914, 1137; [4]*Ibid.* 1914, 955; [5]*Deut. med. Woch.* 1912, 2412.

SALVARSAN.—(*See also* SYPHILIS.)

In the past year it has become evident that the use of salvarsan alone in **Syphilitic** conditions is already passing out of favour. In the practice of many Continental experts it is now the rule to administer a course of mercury before using salvarsan. It is hoped that this method will minimize the risk of a marked reaction. There still seems to be a good deal of doubt as to what produced the angioneurotic symptoms which are sometimes seen to follow intravenous injections of salvarsan and neosalvarsan. It is, however, becoming more and more evident that they are vasomotor toxic effect of the drugs and not, as was formerly supposed, due to the liberation of endotoxins from local depôts of spirochætes in the central nervous system. Last year we referred to Marschalko's experiments where hæmorrhagic encephalitis was produced in healthy rabbits by salvarsan injections. Indirect confirmation of his results has been obtained by Uhlmann's work on the distribution of arsenic in the organs after intravenous injections. He found that the brain contains only very small amounts of arsenic. The object of the experiments was to investigate what experimental evidence there is for Ehrlich's supposition that salvarsan is more parasitotropic than organotropic. Uhlmann's[1] work is in favour of this hypothesis. He found that tissues which normally contained only very small amounts of arsenic under salvarsan treatment, contained distinctly more if they were the site of syphilitic lesions. Conversely, the presence of non-spirochætal disease did not increase the quantity of arsenic retained by these tissues after salvarsan treatment.

The anaphylactoid, angioneurotic symptoms seem to occur fairly frequently. Guttmann[2] saw them occur in 9 out of 51 cases treated with salvarsan. In his experience they are much less frequent with neosalvarsan. They consist in flushing of the face, occasional swelling of the tongue and lips, and rapid pulse. More surely the respiration is disturbed. Brückler[3] saw 9 cases out of 100 show anaphylactoid symptoms. A striking case which is strongly in favour of the vasomotor as against the endotoxin theory is recorded by Müller,[4] in which the symptoms came on, he thinks, as the direct result of impure saline solution. In the midst of a large series of reactionless injections, he noted a series of four cases with rather severe gastro-intestinal disturbance, in which the same saline solutions were used. In one case the patient vomited four times on the day of injection. Next day she was apparently quite well, but on the third day complained of slight giddiness. On the fourth day she suddenly lost consciousness, became very restless, and showed involuntary spasms of the muscles. There was facial paralysis lasting twenty minutes. Next day she remained unconscious, and at different periods showed sudden cyanosis, lasting half an hour, and then during the next ten hours Cheyne-Stokes respiration and slow pulse occurred at irregular intervals. On the next (sixth) day, she suddenly regained consciousness, and all the alarming symptoms ceased, with the exception of the slow pulse. Müller thinks that the saline solution probably contained a trace of some metal, which acted as a catalyser. The sudden and transient nature of the symptoms can, he thinks, only be explained as clinical evidence of a profound vasomotor disturbance of the brain. If, as in his case, the damage is not too profound, the patient may recover; but in other cases, the vasomotor disturbance leads to the formation of hyaline thrombi and hæmorrhages, constituting the hæmorrhagic encephalitis which has frequently been found in patients who have died after salvarsan administration.

A typical case of the fatal type is reported by Busac and Merian[4] after neosalvarsan. A first injection of 0·6 gram was given without disturbance; but eight days later a second injection, though producing no immediate fever or gastro-intestinal disturbance for the first two days, was followed on the third day by headache, slight jaundice, fine tremor of the hands, and twitching of the body, which slowly, during the next twenty-four hours, passed into coma, dyspnœa, and convulsions. Death occurred on the fourth day. In addition to hæmorrhagic encephalitis, there was fatty degeneration of the heart and parenchymatous nephritis, with proliferation and desquamation of the glomerular epithelium.

The general verdict is, that *neosalvarsan* causes less reaction and gastro-intestinal disturbance than the old drug; but Simon[5] states that he has seen at least two cases of angioneurotic reaction of a very severe type. Guttmann[6] states that there is no difference in the therapeutic action, except that the neosalvarsan seems to be less effective in modifying the Wassermann reaction.

The non-irritating action of neosalvarsan is taken advantage of by Castelli,[7] who injected it directly into the cerebrospinal fluid of animals. No toxic action was produced when 0·0112 gram per kilo body weight was injected as a 1 per cent solution, though the animals were kept under observation for several weeks.

In place of the usual method of administering dilute neosalvarsan in saline solution, Ravaut[8] recommends strong solutions in water. He dissolves 0·9 gram in 10 c.c. of water, and states that he has used this solution in 420 cases without ill-effects. The solution is given with an ordinary 10-c.c. "Record" syringe, and the whole amount is injected into a distended vein in the course of twenty seconds. He claims that the use of this small quantity of water eliminates practically both water and chemical contaminations. Strauss[9] and Stern[10] also recommend a concentrated solution of 5 per cent neosalvarsan in water; but Zimmern[11] as the result of some old experiments carried out in 1911 with salvarsan is very sceptical about this method, as in his experience unpleasant results were quite frequent.

Leredde,[12] after further experience, confirms his statement that neosalvarsan can safely be administered to patients who are unable to lie up. A preliminary course of mercury inunctions or injections is used for ten to fourteen days, and the mercurial treatment is kept up during the period in which the neosalvarsan is used. With a minimum interval of one week between each, he gives three injections of neosalvarsan. The total amount must not exceed 2·25 grams. He gives, as a rule, 0·6 gram, then 0·75 gram, and finally 0·9 gram. For preparing the injection he uses twice-boiled pure, or nearly chemically pure, tap-water free from germs, and assists the elimination of the mercury and arsenic by a course of baths, sweating procedures, and eliminating saline drinks.

Kall[13] warmly recommends the use of a neosalvarsan injection as a valuable diagnostic measure in cases where the Wassermann reaction is doubtful. Using Stern's modification, as more delicate than the original Wassermann technique, he states that in doubtful tertiary cases the best time to test is on the day following the injection.

Though most authorities now use only watery or saline solutions of neosalvarsan, Lindenheim[14] strongly advocates the use of intramuscular injections of *joha*. He states that the administration is more effective than intravenous injection, and is practically painless. Yet he, even, has seen pulmonary embolism result,[15] and Hazen had a similar experience when using oily injections of old salvarsan.

Haertel[16] reports a case of **Chorea** in a pregnant woman, which was cured by salvarsan administered intravenously. [The woman had already had an attack of chorea some years before, which makes it doubtful whether the second attack was really a case of chorea gravidarum as the authors claim.—F. J. C.] Zumbusch[17] used neosalvarsan without success in a case of **Hydrophobia**; but Tonin[18] has recorded the successful treatment of a girl suffering from this disease, by intravenous injection of 0·3 gram neosalvarsan. Gerber,[19] in an interesting paper, sums up the curative value of salvarsan treatment in local **Spirochætosis of the Mouth, Gingivitis,** ulcerated gums in **Mercurial Stomatitis, Scurvy, Plant-Vincent Angina,** etc., and advises local applications of salvarsan and neosalvarsan.

Alwen[20] and Loewy and Wechselmann[21] publish independent investigations, which show that a kidney damaged by mercurial treatment is more susceptible to salvarsan than a healthy kidney. The vascular response of the kidney vessels to central stimuli (blowing tobacco-smoke into the nostrils), and peripheral stimulation (injection of epinephrin), is slightly affected, but may remain evident, though greatly diminished, till a late period of intoxication, but the watery excretion is markedly diminished, and may be completely abolished. The damaged kidney may secrete non-albuminous urine, so that the absence of albumin does not necessarily mean that the kidneys are not damaged by the mercurial treatment. The best indication seems to be the diminution in the absolute quantity of urine. These investigations show that there is a certain amount of risk in combining mercurial and salvarsan treatment, as the kidneys may suffer damage, and be unable to remove the salvarsan sufficiently rapidly to prevent poisoning.

Morgenroth and Tugendreich[22] publish some interesting experiments on *combined chemotherapy*. Ethyl-hydrocuprein is fairly active as a temporary trypanocide, but sodium salicylate is devoid of trypanocidal action, though possibly of slight prophylactic value. Yet the combination of inactive amounts of ethyl hydrocuprein and sodium salicylate results in a distinct increase in the trypanocidal effect, so that temporary removal of trypanosomes from the peripheral blood of infected mice can be achieved. The combination of these two drugs with minimal (inefficacious if used alone) quantities of salvarsan gave certain therapeutic results which led the authors to recommend that their combination should be tested in human disease, as, if the same results are obtained in man, the use of the smaller amount of salvarsan will greatly lessen the risk of arsenic poisoning.

Fleming[23] reports a case of fatal hæmorrhagic encephalitis which caused the death of a young man, 19 years of age, who was suffering from early secondary syphilis. He was given two injections of 0·6 gram salvarsan at an interval of fourteen days. The first injection caused a slight reaction, and the second was also followed at first by merely a slight reaction. In the course of the next two days he fell ill with epigastric pain and hypersensitiveness to noises. In the course of the next eight hours he became irrational, then stuporose, and had convulsions, dying four days after the injection. The particular interest of the case consists in the fact that he was one of four men infected on the same night by the same woman. One other of the four received salvarsan treatment, which was well borne. This seems to prove conclusively that the poisoning must be due to an individual susceptibility to salvarsan, and not to any special potency of the strain of spirochæte. Kreibich[24] records a fatal case of salvarsan poisoning in which ecchymoses and softening of the abdominal muscles developed after repeated intravenous injections over the abdomen. Post mortem, a hæmorrhagic necrotic degeneration of the muscular tissue was found.

REFERENCES.—[1]*Wien. klin. Woch.* 1913, 101, 216, 416, 419, 978; [2]*Berl. klin. Woch.* 1913, 911; [3]*Deut. med. Woch.* 1912, 1587; [4]*Münch. med. Woch.* 1913, 803; [5]*Ibid.* 1912, 2390; [6]*Ibid.* 2458; [7]*Deut. med. Woch.* 1912, 1637; [8]*Presse Méd.* 1913, 502; [9]*Münch. med. Woch.* 1913, No. 11; [10]*Therapeut. Woch.* 1913, No. 14; [11]*Münch. med. Woch.* 1913, [illegible]; [12]*Berl. klin. Woch.* 1913, [illegible]; [13]*Münch. med. Woch.* 1913, [illegible]; [14]*Berl. klin. Woch.* 1912, 2177; [15]*Jour. Amer. Med. Assoc.* 1913, i, 1016; [16]*Münch. med. Woch.* 1913, 183; [17]*Wien. klin. Woch.* 1913, 1260; [18]*W. Virginia* 1912, July; [19]*Presse Méd.* 1912, [illegible]; [20]*Münch. med. Woch.* 1913, [illegible]; [21]*Ztsch. f. Exp. Path. u. Pharm.* [illegible]; [22]*Berl. klin. Woch.* 1913, 1142; [23]*Ibid.* 1201; [24][illegible]; [25]*Münch. med. Woch.* 1913, 1712.

SCARLET RED.

Allan[1] finds a 1 per cent ointment of scarlet red useful in **Injuries and Ulceration of the Cornea.** It does not cause much discomfort, but in a few cases he has seen a little irritation follow its use. For granulating surfaces a stronger ointment (2 to 4 per cent) may be used.

Lyle[2] reports a case of poisoning from the use of 8 per cent scarlet red ointment. A woman, fifty years old, after using the ointment on a large burn, noted, on the sixteenth day, headache, dizziness, and faintness. Next day she vomited, was nauseated, and had severe pains in the abdomen. The urine contained albumin but no casts. The gastric and abdominal symptoms persisted for ten hours. On applying the ointment a week later the same symptoms developed though less severely.

References.—[1] *Ther. Gaz.* 1913, i; [2] *Med. Rec.* 1912, ii, 897.

SEA WATER.

Packard[1] records a case of apparently hopeless **Peritonitis** where the use of marine plasma proved successful after all other measures had failed. The patient developed extreme tympanites and paralysis of the bowel after an operation for perforated appendix. As a last resort 100 c.c. of plasma were injected into the gluteal region, and this was so successful that for four days it was repeated twice daily. The patient ultimately recovered after a localized abscess in the peritoneum had been opened. Packard states that in two other cases of threatened peritonitis he has seen good results from the use of sea-water injections.

Reference.—[1] *Bost. Med. and Surg. Jour.* 1913, i, 544.

SERUM, ANTISTAPHYLOCOCCIC.

Thomas[1] has found good results in infections due to *Micrococcus pyogenes aureus* with a potent polyvalent serum obtained by treating a ram with increasing doses of several strains of *M. aureus* from different types of human disease. He used it chiefly in a series of cases of **Carbuncles** and **Furuncles.** The results were very good. No new boils formed, and those present healed rapidly, the therapeutic effects being more prompt than with vaccine treatment. Of special interest is the only case of staphylococcic bacteriæmia treated with the serum. This patient had **Acute Osteomyelitis** following an osteotomy, and subsequently the knee and wrist became septic. Vaccines aggravated the condition, but mercury succinimide, arsenic, and tonics led to some improvement. At the end of ten months the serum treatment was instituted, and was immediately followed by great improvement: the wrist healed, sinuses closed up, and the weight increased. Five injections were given, and in a month the patient was discharged from hospital.

Reference.—[1] *Jour. Amer. Med. Assoc.* 1913, i, 1070.

SILVER ARSENITE. (*See* Arsenite of Silver.)

SILVER, COLLOIDAL.

Netter[1] uses preparations made both chemically and by electric methods, but generally prefers the former except for hypodermic injections. Speaking of their use in the case of children, he states that inunction of a 15 per cent ointment is useful in **Pneumonia** and **Bronchopneumonia,** being usually followed in a few hours by a fall of temperature and improvement in the general condition. In bronchopneumonia he often uses subcutaneous injections of electrargol or weak solutions of collargol, ·25 gram to the litre. In severe cases intravenous concentrated injections of 1 to 2 per cent can be used, and may sometimes abort pneumonias. They also act well in certain cases of **Infectious Endocarditis, Rheumatism,** and **Pyæmia.** They are useful adjuncts to serum therapy in **Diphtheria.** **Intestinal Infections** are best treated with oral administration of 20 to 40 centigrams daily, or by rectal injections of 0·4 to 1 gram, which give good results in **Dysentery, Paratyphoid,** and **Typhoid Fever.** One of the most successful applications consists in the use of a nasal injection of 1–100 in children suffering from **Adenoids.**

There seems little risk of producing argyria even after long continued use. In one case, where injections were continued uninterruptedly for two years in an epileptic, a slight argyria was produced.

Reference.—¹*Presse Méd.* 1912, [illegible]

SQUILL.

Pic and Bonnamour¹ draw attention to the valuable diuretic properties of squill. In health it has little effect in promoting diuresis, but increases notably the excretion of urea. In suitable cases of **Nephritis** it greatly increases both the amount of urine and the excretion of nitrogenous bodies. It does not promote the excretion of chlorides to any marked extent. Hence its chief clinical value as a diuretic is in those cases of **Dropsy** where there is a marked reduction in the excretion of urea. If the chlorides are also diminished, squill should be combined with theobromin, which increases their removal. When the œdema is due to cardiac failure, it is good practice to combine squill with digitalis. The best method of administering squill as a diuretic is in the form of a powder. They give 0·15 gram in cachets three or four times daily, and state that in these quantities it does not damage the renal epithelium or increase albuminuria.

Reference.—¹*Presse Méd.* 1912, [illegible]

SUGAR.

Magnus¹ has tested sugar as an application to **Wounds** and **Ulcers.** He finds that commercial loaf sugar is practically sterile. It was free from pathogenic germs, and in the few cases where growth occurred, only harmless saprophytic organisms developed. He applies the dry sugar directly to the wounds, and finds that it is unirritating, while it acts as an efficient deodorant. It rapidly dissolves, and then exerts considerable osmotic attraction, causing a profuse secretion of serum which flushes out the wounds and prevents the dressings from becoming adherent. It also seems to have the property of dissolving fibrin. As a result the wounds clean rapidly, are free from odour, form healthy granulations, and epithelialize in a short time. He states that it is specially valuable in promoting rapid healing of drainage **Sinuses**; large septic wounds also do well, but tuberculous wounds do not. His experience extends to over 100 cases treated in the Marburg surgical wards.

Reference.—¹*Münch. med. Woch.* 1912, [illegible]

SULPHUR.

Vörner¹ describes a new method of applying sulphur to the skin. A concentrated solution of potassium sulphuratum containing [illegible] grams in 100 c.c. of water, is painted or rubbed over the diseased skin and allowed to dry. The parts tinged yellow are now sprayed with acetic acid vapour or moistened with 5 to 10 per cent acetic acid, which decolorizes the skin and leaves a fine powder adherent to it. This method is suitable for reducing hyperæmia and producing dryness of the skin, and is especially useful in **Acne Rosacea, Seborrhœa Oleosa,** and **Eczematous** or **Follicular Processes** depending on these causes. An ointment suitable for antiparasitic action in **Seborrhœa Sicca, Impetigo,** and **Parasitic** or **Fungous Infections** is prepared as follows: In one kilo of fat, 2 to 2·5 grams sulphur are dissolved at 50° to 100° C.; then 50 to 55 grams oleum sulphuratum are added, and lastly 40 to 50 grams freshly precipitated and filtered calcium sulphide, dried with absolute alcohol, are added and thoroughly mixed. This can be used pure or diluted with boric ointment.

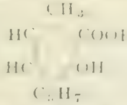
REFERENCE.—[1]*Münch. med. Woch.* 1912, 1909.

SUMBUL.

Macht[1] has studied the action of the tincture of sumbul in a series of 100 neurasthenics exhibiting many varieties of functional nervous disorders. The results were not good. The same holds true in disorders of the menopause. He concludes that it has no specific action in the menopause, and that the ordinary commercial sumbul on the U.S. market is an inert, useless, and needlessly expensive drug, which should be removed from the pharmacopœia.

REFERENCE.—[1]*Ther. Gaz.* 1912, 764.

THYMOL DERIVATIVES.

Bachem[1] publishes notes on two new thymol derivatives. Thymotinic acid  $C_6H(CH_3)(COOH)(OH)(C_3H_7)$ occurs in white crystals insoluble in cold, slightly soluble in hot water, soluble in acetic acid, alcohol, ether, chloroform, benzol. It is readily absorbed, and is not toxic for rabbits in doses of 2 grams. It is a fairly strong antiseptic. Thymacetol, the acetone ester of thymotinic acid, is a white crystalline powder, insoluble in water, but soluble in organic solvents and in animal and vegetable fats. It is relatively non-toxic for rabbits, and is absorbed when rubbed on the unbroken skin. It possesses antiseptic properties, but of more interest is its anæsthetizing action. The rabbit's cornea is anæsthetized completely in two or three minutes, the effect gradually passing off in half an hour. Bachem suggests, as worthy of clinical investigation as a **Local Anæsthetic,** a 10 per cent solution of thymacetol in ethoxy-propionic-menthol ester, which is also a fairly strong non-toxic local anæsthetic. Thymacetol, he suggests, might be used in **Wounds** and **Ulcers** when nerve-endings are exposed, while the menthol-ester solution might be tested in **Irritable Conditions of the Throat.**

REFERENCE.—[1]*Berl. klin. Woch.* 1912, 2086.

TRYPASAFROL.

This dye, belonging to the safranin series, has recently been suggested as a trypanocidal agent worthy of trial in man. Ritz's[1] investigation of its trypanocidal action in experimental trypanosomiasis in mice shows that it is relatively feeble as a trypanocide, and therefore not likely to be of use in human trypanosomiasis.

Reference.—[1] *Berl. klin. Woch.* 1913, 1157.

TYRAMINE. (*See also* Ergot.)

Hoyt,[1] after testing the therapeutic action of this preparation, states that it is uncertain and slow in its action on the circulatory system when given by the mouth. In doses of 20 to 40 mgrams it produces a marked and abrupt rise of blood-pressure, which is very fugacious and sometimes accompanied by irregular heart-action, with slowing of the pulse. The drug cannot be depended upon for a prolonged action, but may be of use in cases of temporary vasomotor depression.

Reference.—[1] *Amer. Med.* 1913, ii. 70.

UREABROMINE.

This preparation, calcium bromide urea, $CaBr_2 . 4 CO(NH_2)_2$, contains 36 per cent bromine. Johannessohn[1] has found it a useful sedative which in several cases controlled **Motor Spasms.** It also acts well in pure **Nervous Excitement of Cardiac Disease** associated with rapid pulse, and in **Nervous Sleeplessness.**

Reference.—[1] *Deut. med. Woch.* 1913, 268.

URINARY ANTISEPTICS. (*See also* Hexamethylenetetramine.)

Jordan[1] in an interesting article describes experiments planned to estimate the antiseptic action of various drugs reputed to be urinary antiseptics. By the administration of acid phosphate of sodium or alkaline citrates, the reaction of the urine was varied. As tests of the antiseptic action, he noted the development of putrefaction and the growth of staphylococci and *B. coli* in the urine passed after administering the urinary antiseptic. The serum was sterilized by passage through a Chamberland filter before being inoculated with the test organisms. His conclusions are as follows:—

"The acidity of the urine is readily increased to an extent of more than double the normal by acid sodium phosphate, and to a considerably less extent by benzoates. With large doses of citrates it is easily rendered alkaline. Putrefaction of the urine and the growth of the staphylococcus is aided by alkalinity and delayed by acidity in proportion to the amount thereof. The reverse is the case with *B. coli*, but only to a small extent.

"Hexamethylenetetramine is not itself antiseptic, but acts by producing formaldehyde in the urine. This only takes place in acid urine, and the drug is inert in alkaline urine. The degree of antiseptic power is proportionate to the acidity, and where this is normal or increased the drug is far the most efficient of all the urinary antiseptics. Despite its undoubtedly different behaviour in the test tube, there is no evidence that helmitol acts differently from hexamethylenetetramine in the urine, and this remark applies also to citramine, hetraline, and cystopurin.

"Sandalwood oil is a bad general antiseptic, but appears to have a specific action on the staphylococcus which may apply to cocci generally. It is of some use in alkaline urine. Benzoic and salicylic acids are very similar in action. Both are fairly efficient antiseptics in the urine, but are of very little use in alkaline urine. Boric acid is an efficient antiseptic. Its action is unaffected by alkalinity, so that it is the most efficient drug in alkaline urine we possess. Uva ursi is quite a good antiseptic. Its action is certainly not due chiefly to the arbutin it contains."

The following are, he thinks, legitimate practical deductions. "The use of urotropin (together with acid sodium phosphate, which should always be given with it) as a prophylactic before any operation or procedure where the urine may become infected is of the utmost value, since if the urine is clean and highly acid, and sufficient urotropin is given in small doses to keep it continually present, the urine will not support the life of any organism, and becomes indeed a powerfully antiseptic fluid. Urotropin should only be given where the urine is, or can be made, acid, otherwise it is inert. It should never be given with potassium citrate in *B. coli* infections. If it is desired to try the effect of making the urine alkaline in these conditions, use boric acid and uva ursi infusion."

REFERENCE.—[1]*Brit. Med. Jour.* 1913, ii, 648.

UROTROPIN. — (*See* HEXAMETHYLENETETRAMINE, URINARY ANTISEPTICS.)

UZARA.

Eisenheimer[1] adds another to the series of favourable reports on uzara as a useful drug for controlling **Diarrhœa.** It acts well in all forms, but he specially mentions its use in the diarrhœa of **Typhoid Fever** and **Dysentery,** and in diarrhœa following **Food Poisoning.** As a rule, he gives 20 to 30 drops of the 2 per cent solution every two hours, but he has also used tablets and suppositories. After eight or ten doses the tenesmus of severe diarrhœa ceases, though the stools may still remain frequent. Usually, on the second or third day, the motions become firmer and the diarrhœa ceases.

REFERENCE.—[1]*Deut. med. Woch.* 1912, 2415.

VACCINES.

Moore Alexander,[1] discussing the use and abuse of vaccine therapy, summarizes the chief bacteriological errors that cause failure as follows: the want of early and accurate diagnosis, the use of stock vaccines in undiagnosed conditions, and administration without any regard for the reaction, the interval, or the progress of the patient's immunity.

Stone[2] also insists on the necessity of accurate knowledge of the bacteriological condition present. Speculation should not enter into the consideration of the rational worker. Thus he objects to the use of "rheumatism phylacogen" in acute and chronic rheumatism. The exact bacteriological conditions are unknown, and the use of such a mixture of the metabolic products of a number of strains of pathogenic bacteria is a shotgun mixture with no scientific basis. As regards the use of tuberculin, he is rather sceptical. He is not satisfied that patients treated with it improve in the aggregate any more than those receiving none. He has repeatedly seen harm result from the indiscriminate use of tuberculin. There is also the difficulty of knowing which type of bacillus is producing the tuberculous lesions. In any case, if tuberculin is used, it is decidedly better to employ the small doses advocated by Wright, as they have the merit of comparative safety. The most suitable type is the chronic case with good nutrition and no complications. Though he has had a few good results with vaccine therapy in streptococcic septicæmia, he is not convinced that the results obtained by vaccines will be any better than with antistreptococcic or streptolytic sera or normal human serum. Possibly the most gratifying results in bacterial therapy are obtained in localized **Staphylococcic Lesions.** In localized **Gonorrhœal Infections** he thinks that vaccines help. Vaccines prepared from freshly isolated strains do not seem to give such good results as older strains, and there is no advantage to be obtained from autogenous strains. For diagnostic purposes an injection of vaccine will often differentiate the gonococcal lesion by the resulting reaction, but care must be exercised, as he has seen epididymitis follow on an excessive dose. He thinks that the prophylactic use of vaccines is of value in many conditions.

Ellern[3] has used Wright's pollen extract in 13 cases of long-standing **Hay Fever**. The results were fairly good. None of the patients were entirely cured, but only 2 felt that they had not obtained benefit from the treatment, 5 were improved, and in the remaining 6 cases the improvement was very marked. The importance of these results is, however, considerably discounted by the fact that last year was apparently not a severe one for hay-fever sufferers, as 20 patients who did not receive the vaccine treatment reported that they had suffered less than usual. Only 4 stated that they had been as bad as usual, 14 had been better than in the previous year, and 2 stated that they had been greatly better.

Sill[4] reports good results from the use of vaccines in ten cases of **Erysipelas in Infants.** He considers that streptococcus vaccine is by far the most efficacious treatment at our command in this disease. Large doses at intervals of twenty-four hours should be used.

Szily[5] has obtained very satisfactory results in the **Multiple Cutaneous Staphylococcic Lesions** of infants.

Wynn[6] has had good results from the use of vaccines in various types of **Septicæmia.** In fifteen cases of ulcerative endocarditis in which a streptococcus was isolated from the blood, vaccine treatment proved unsuccessful. In several cases temporary improvement was seen, but it was not maintained. In other types of septicæmia the results were more satisfactory, notably in **Puerperal** cases and in **Infections with**

B. coli. The cases all seem to have been severe. The effect of the first or second dose of vaccine was usually shown by an alteration in the type of temperature, which often became intermittent where it had previously been remittent or maintained at a high level. Associated with this, subcutaneous abscesses frequently formed rapidly, but these might subside without suppuration, apparently an attempt on the part of the organism to localize the disease. The change of temperature is a good sign, and if it does not occur with the first inoculation the dose should be raised until it does.

Fisher[7] points out that **Common Colds** are unquestionably due to infection by micro-organisms, and are contagious. They can be largely prevented by reasonable isolation of each case, and preventive inoculation which aborts or shortens the disease. He uses a stock vaccine containing many different strains. The dosage which seems to give the best results are *Pneumococcus, M. catarrhalis, M. tetragenus*, 125 million of each ; *Streptococcus*, 50 million ; *B. influenzæ, B. septus, B. Friedländer*, about 100 million ; *Staphylococcus*, 400 to 800 million. The patient's own autogenous strain may be added to the stock vaccine. The vaccine should be so prepared that the dose is contained in 8 minims. Four or five injections at weekly intervals in increasing doses usually give sufficient immunity to last for several months.

Hirschfelder[8] has used digestive bacterial extracts in **Gonorrhœal** conditions with a fair degree of success. A suspension of the gonococcus was heated to 38° C. ; to it was added an equal quantity of 0·2 per cent solution of pancreatin with 2 per cent sodium bicarbonate, which was allowed to act at 38° C. for fifteen minutes and then acidulated with hydrochloric acid to stop the action of the ferment. The mixture, filtered through a Pasteur filter, was then ready for use. The usual dose was 5 c.c. intramuscularly, which is in most cases followed in a few hours by a reaction, chill, malaise, and fever. Often succeeding doses produce less reaction, and the dose may be increased. In gonorrhœa, fairly good results were obtained in females, but the results in males were less distinct. Thus, in one series of 20 prostitutes treated with vaccine and the usual methods, in 18 a rapid cure was obtained, in 10 cases after one injection, in 6 after two, and in 2 after three injections. Five out of 7 cases of epididymitis recovered rapidly and 7 cases of gonorrhœal rheumatism were also cured under vaccine treatment.

Ross[9] has an important paper in which he summarizes his results obtained in over 400 cases of acute and chronic infectious disease. This series of cases received treatment at St. Thomas' Hospital during the three years 1908–1911. Starting at first with full doses at intervals of ten days, this was found to cause a good deal of constitutional disturbance, and it was found advisable to administer smaller doses intramuscularly every five days, as the local and constitutional disturbance was thereby lessened. As it seems likely that the antibodies are formed locally at the site of injection, this was changed as far as possible at each dose. As a rule a course of six or eight injections was given. The average dose in millions was *Staph. albus* 100 to 200, *Staph. aureus* 50 to 150, *Streptococcus pyogenes* 5 to 20, *Pneumococcus* 3 to 10, *Gonococcus* 3 to 5, *B. coli* 50 to 150, *B. typhosus* 500 to 1000, *B. acnes* 5 to 10.

Furunculosis was amenable to vaccine treatment; out of 80 cases 60 per cent were cured and 15 per cent improved. Stock vaccine did well, provided it was not over three months old and made from the pure culture isolated directly from the tissues. Laboratory subcultures are very inferior. If the stock vaccine produces no improvement with three or four inoculations an autogenous vaccine should be prepared. Acute infectious bone disease was not so favourably influenced as furunculosis by vaccine treatment. Vaccine only acts as an adjuvant, and no case should be treated with it till surgical means have been tried. Small doses of vaccines are sometimes useful when there is an unsatisfactory healing response after operation; but **Acute Osteomyelitis,** with threatening pyæmia, is one of the most difficult problems for the vaccinist to face. Ross advises the use of a good stock vaccine made from an acute bone case. As soon as the temperature drops, vaccine treatment should be stopped. Sequestra must, of course, be removed. When the staphylococcic infection is secondary to psoas abscess, the case is unsatisfactory for vaccine treatment. Cases which do well after operation should be left alone but sometimes, when they do not improve after opening and drainage, vaccines do good.

In **Carbuncles,** vaccine treatment seems to assist surgical measures in promoting cure, clean granulations forming sooner and the sloughs separating quickly. Infections with *Staphylococcus albus* are chiefly represented in his series by **Acne Vulgaris.** Treatment with mixed stock vaccines of *Staph. albus* and *B. acnes* gave good results, 10 out of 27 cases being cured. Though relapses are common, renewed treatment is again satisfactory. Pneumonia was not appreciably affected by vaccine treatment, which should only be used with extreme caution. Neither was it very successful in pneumococcal empyemata but it was satisfactory in **Pneumococcal Arthritis.**

Out of 48 cases of streptococcic infection, the best results were obtained in **Cellulitis** and **Abscesses.** There was no benefit in two cases of malignant endocarditis. Three cases of **Suppurative Arthritis** were cured and one improved out of a series of five. Twenty-three cases of **Erysipelas** treated with fresh stock vaccine (not over a month old) made from erysipelas cases, led the author to conclude that it has no specially good effect, and is merely an adjuvant to other methods.

In 22 cases of **Coli Bacilluria,** vaccines produced a cure in 7 and improvement in 11. In 5 out of 8 cases of **Appendicitis** where an obstinate fæcal fistula had formed after operation, the administration of a *B. coli* vaccine certainly resulted in benefit; but cases of dysentery and colitis were unsatisfactory in their reaction to the treatment. In **Gonococcal Infections,** vaccine treatment caused considerable improvement as regards pain, but was less [illegible] in increasing mobility and freer use of the joints. Nor was it easy to say how far the benefit was due to associated forms of treatment.

Sensitized Vaccines.—Gordon[10] reports an interesting series of cases in which these apparently gave good results. His series consists of 19 cases of **Streptococcic Infection.** In twelve of these the vaccine produced great improvement though at least six had received ordinary surgical and medical treatment in vain and were in a serious condition when it was used. Three had streptococcæmia. When the vaccine was given, the general and local condition improved, temperature fell, and the patients began to get well. Gordon used a stock vaccine, consisting of three to five mixed strains, sensitized, and then killed with phenol. He gave increasing doses subcutaneously, usually commencing with 100 millions and rising rapidly to 500 and 1000 millions. His general conclusion is that any power of resistance latent in the patient is rapidly awakened by the use of sensitized vaccine, even at a comparatively late stage of the infection. He suggests the prophylactic use of sensitized vaccines before operative procedures and in the face of epidemics.

McLean[11] reports a case of subacute rheumatism, in which the intravenous administration of *rheumatism phylacogen* was apparently fatal. Within forty minutes of the injection the patient had a prolonged rigor, with delirium, vomiting, and weak circulation. For the next seven days he passed very little urine, and eventually developed a terminal hypostatic pneumonia.

McCall[12] has had good results from phylacogen treatment of "**Chronic Rheumatism,**" **Rheumatoid Arthritis,** and chronic **Gonorrhœal Infections.** Out of a series of 30 cases the results were highly satisfactory except in 2.

References.—[1]*Liverp. Med.-Chir. Jour.* 1913, 198; [2]*Jour. Amer. Med. Assoc.* 1913, i, 189; [3]*Deut. med. Woch.* 1912, 1590; [4]*Med. Rec.* 1913, i, 573; [5]*Wien. klin. Woch.* 1912, 1739; [6]*Clin. Jour.* 1913, Apr. 49; [7]*Bost. Med. and Surg. Jour.* 1913, i, 834; [8]*Jour. Amer. Med. Assoc.* 1913, i, 1061; [9]*Pract.* 1913, ii, 96; [10]*Lancet,* 1913, i, 1801; [11]*Jour. Amer. Med. Assoc.* 1913, i, 588; [12]*Lancet,* 1913, ii, 432.

WORMSEED OIL.

It is difficult to disguise the taste of this anthelmintic oil (oleum chenopodii anthelminthici), but it can be most readily given as an emulsion with castor oil. A German preparation of this kind called wermolin has been successfully tested clinically by Brüning against **Round-worms** in children. It acted well if followed in two hours by a simple purge.

Reference.—[1]*Deut. med. Woch.* 1912, 2368.

RADIO-ACTIVITY AND ELECTROTHERAPEUTICS.

BY

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The feature of 1913 from the point of view of radiology is that, for the first time at an International Congress of Medicine, there was a separate section for this branch of work. Under the presidency of Sir James Mackenzie Davidson its justification was its success. In addition to numerous and valuable papers on all the important branches of x-ray diagnosis and treatment, there were reports and discussions on the x-ray examination of the thorax, the radiography of the stomach and intestines, a joint discussion with the gynæcological section on the uses of x rays and radium in gynæcological conditions, and a discussion with the orthopedic section on the value of x rays in various conditions of bones and joints. Full reports of all the papers and discussions will be published in the "Proceedings of the Section,"[1] and to this we would refer our readers for much valuable information.

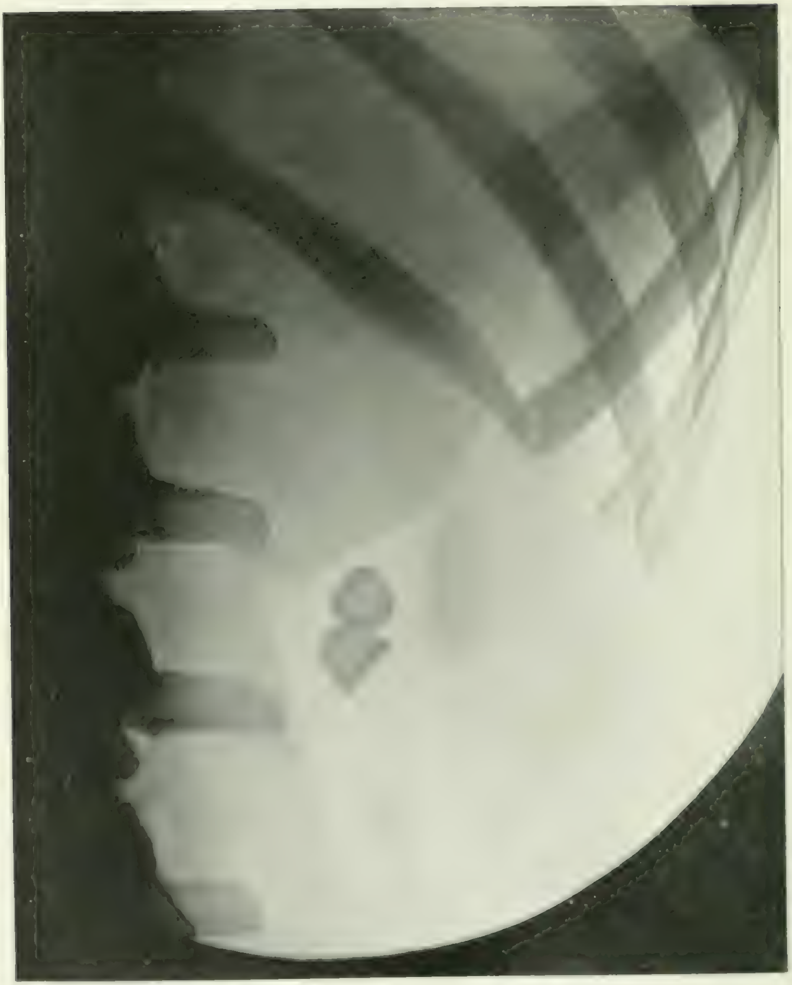
The year has also been noticeable for the very marked advance in the recognition of the value of radium in the treatment of disease, and a corresponding demand, evidenced especially in England and Germany, that the hospitals of both countries should possess sufficient quantities to deal efficiently with the cases which require such treatment. As it is now possible to collect in glass capsules definite measured doses of the emanation from radium, and use these for treatment—the effects being exactly the same as if the original radium itself were used—larger numbers of cases can be dealt with at the same time.

One of the most striking papers read at the Congress was by Abbe,[2] of New York, who detailed the results of his experiments upon plant growth after the seeds had been exposed to larger or smaller doses of radium, the chief points being: (1) That according to dosage he obtained two effects, one being to stimulate and the other to retard growth. (2) That the distance of the radium, without filtration, from the parts exposed had a marked result upon the effects produced. The first of these findings has an important bearing on the suggestion which has been advanced, that some cases of malignant disease have taken on a more rapid growth after exposure to radium; and the experiments seemed to indicate not only the reasons for this, but also—and this is of the greatest importance—the lines on which the treatment should be conducted in order to avoid such a result.

REFERENCES.—[1] *Trans. Rad. Section 17th Intl. Cong. of Med.*; [2] *Ibid.* and *Brit. Med. Jour.* 1913, ii. 910.

PLATE I.

SKIAGRAPH OF GALL STONES



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NEW APPARATUS.

Three instruments were shown at the Congress exhibition, marking a distinct advance in *x*-ray instrumentation.

Messrs. Siemens Bros. showed a large *transformer* on the lines of the Snook machine. It was so arranged that on the one hand the smallest possible current could be used for tube excitation ; and on the other, by a very simple adjustment, an enormous single-pulse flash could be obtained for the most rapid radiographic exposure.

The Veifa Works had on exhibition *Dessauer's x-ray Biograph.* This is a mechanical plate-changing machine enabling eight separate plates to be automatically placed in position and exposed in about one second ; it also allows of the automatic exposure of the plates in rapid or slow succession, or separately at any desired moment.

The same firm also showed a *stereo-fluoroscope*, by means of which the image is seen stereoscopically upon a fluorescent screen.

X-RAY DIAGNOSIS.

Radiography of the Abdomen.—Two papers mark a step forward in the radiographic diagnosis of *gall-stones.* Thurstan Holland,[1] in three cases, succeeded not only in showing gall-stone shadows, but in their interpretation as being different from those of renal stones and other conditions giving abdominal shadows. Although the negative diagnosis by *x*-rays is never possible, a positive result should be obtained with much greater frequency than has hitherto been considered possible. One feature of gall-stone shadows in a large percentage of the cases in which they can be shown is that the circumference, owing to lime salts being deposited upon the surfaces of the stones, is much more opaque than the central portion, and thus the shadows are very often either annular or dark-edged (*Plate I*). Case[2] records remarkable success in this method of diagnosis, and has shown gall-stones in 40 cases out of 1000 sent to him for stomach examination. He lays much stress upon the value of stereoscopic *x*-rays in making the differential diagnosis, and publishes some remarkable examples. His opinion is that if suspected cases were examined systematically, they should be shown in from 40 to 50 per cent of those in which they were actually present. He advises moderately soft new tubes, and instantaneous exposures.

The importance of these papers lies in the fact that it has been generally considered by radiographers for some years that the examination in suspected cases is scarcely worth making, owing to gall-stones showing so rarely. In view of the modern improvements in technique, etc., and the above results, systematic *x*-ray examination should be carried out in future.

The Liver itself can be examined radiographically. Jaugeas[3] describes anomalies of situation, changes of volume, and anomalies of form, all made out by a screen examination. Hypertrophy and atrophy can both be demonstrated, whilst in many cases the alterations due to hydatid cyst or abscess are clearly indicated.

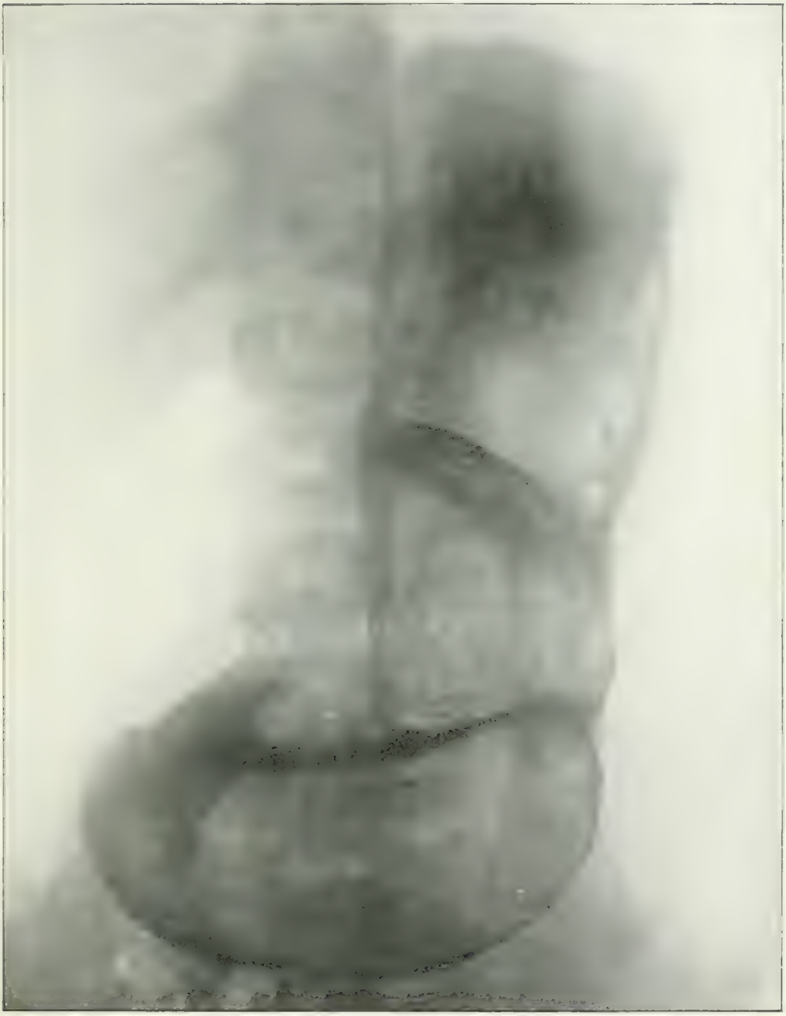
The Stomach.—Thurstan Holland[1] describes a new technique for obtaining a radiograph in any particular stage of its contraction. Noting on the screen the exact phase required, the number of seconds is counted between the stomach being in this condition and resuming it once more. As a rule this is 20 seconds, rarely more, sometimes from 1 to 4 less. To obtain a plate at the exact moment, proceed as follows: Start a stop-watch at the time the stomach presents the required shape, place a plate in position, and then expose at a multiple of the number of seconds noted. The whole operation need not take more than from one to two minutes, and experience has shown that it is almost always successful. The chief value is that a picture of the varying pyloric end can be made with exactitude at any particular moment which is desired.

The same author[2] calls attention to the radiographic appearances in a case of **Hair Ball in the Stomach** (*Plates II, III*). In this case the nature of a large tumour in the upper abdomen was quite uncertain, and was not suspected as being gastric until the x-ray examination showed this to be the fact. The barium food (a thin emulsion) was observed to flow into the stomach and coat the walls, the shape of the organ being beautifully defined. It was difficult to account for the two dark bands of shadow crossing the stomach; at the operation three distinct hair balls which articulated upon one another with facetted surfaces were found and removed; the dark bands were caused by the food flowing between these facetted surfaces. The author points out that in this case, in which the hair-balls filled the entire stomach, the organ shows the J shape described by radiologists. A case of a similar description is recorded by Barclay,[3] in which the exact diagnosis, unsuspected beforehand, was demonstrated by radiography. He very ingeniously dilated the stomach with carbon dioxide, when the upper end of the hair ball could be pushed up into the large "magenblase" and easily seen. Again, the shape of the hair ball corresponded almost exactly to that which radiologists consider to be the normal stomach.

Franz Groedel[4] points out that the rate of emptying of the normal stomach is much faster with the *barium sulphate meal* than with the bismuth meal. He claims that it is twice as fast. On the other hand, his experiments showed no difference in the motility of the large intestine. He advocates the use of barium sulphate in preference to bismuth, and states his reasons for this. [These observations on the rate of emptying of the stomach must be accepted with reserve. In a very large number of cases examined with barium during the past eighteen months, the writer has noted no difference whatever in the motor times of the stomach as compared with the cases receiving bismuth.—C. T. H.]

Mixter[5] describes the x-ray appearances in **Congenital Hypertrophic Stenosis of the Pylorus** as seen in four cases. The chief point is that the pyloric end maintains a rounded, prow-like appearance, whilst the bismuth food assumes a dense ball-like mass at the most dependent

HAIR BALLS IN THE STOMACH

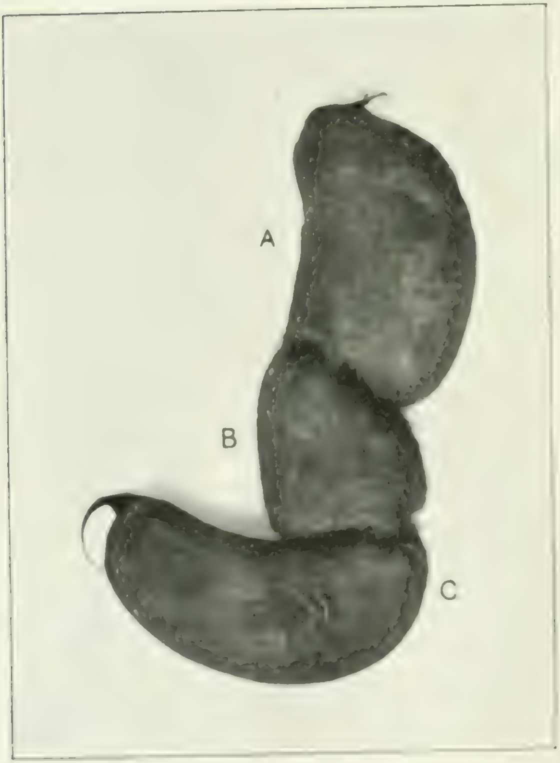


Skiagraph of three hair balls in the stomach. Appearance after giving emulsion of barium sulphate.

Photo. H. Cox

PLATE III.

HAIR BALLS IN THE STOMACH [illegible]



[illegible]

position of the greater curvature; and that this condition will often remain unchanged for hours. His paper is illustrated with a series of splendid radiographs taken at intervals after the meal; and also a number showing the results of operation, immediate, and as much as three years later. In one case, three years after the operation the stomach was seen to empty itself in as short a time as fifteen minutes after a meal, and yet the nutrition of the child was unaffected.

Haudek[9] makes some interesting observations on **The Diagnostic Value of Gastric Antiperistalsis**, which has hitherto been looked upon as confined to cases of pyloric stenosis. From an examination of sixty cases in which it was observed on the screen, and in which an operation had later been performed, he found that it was always associated with pathological alteration of the stomach wall, most frequently, but not invariably, with pyloric stenosis.

Pfahler,[10] in an interesting paper on the value of the x-rays in **Gastric Ulcer**, is of opinion that retention of food in the stomach after six hours, if not accompanied by tumour formation or in an otherwise normal stomach, is one of the most valuable signs of acute or florid ulcer. Retention may occur in gastric ulcer when the stomach outline and the peristaltic waves are quite normal.

Barclay[11] publishes the results of his examination of a large series of cases in two articles on **Gastric and Œsophageal Affections**, too long to be reviewed in detail, but full of original observations and suggestions. On one point he is quite clear. "The more time one spends on a case, and the more one considers the x-ray findings in connection with the clinical history, the more accurate will be the diagnosis. The x-ray method is of some value by itself, but when it is taken in conjunction with *all* the other available means of investigation, it becomes the greatest of all aids we possess in the diagnosis of diseases of the walls of the intestinal tract."

Anderson[12] relates a case in which **Enteroliths** gave an x-ray shadow and caused difficulty in diagnosis. Two were present as a tumour in the region of the cæcum, and cast overlapping shadows over the iliac bone. They were removed by operation. Calcium phosphate in the nucleus and capsule of each rendered them opaque to x-rays. Rochet, Gayet, and Arcellin[13] also call attention to this rare condition, quote several cases, and point out that the shadows show no special characteristics, and may be mistaken for renal calculi, leading to errors in diagnosis. They have found these bodies in the appendix, and also in the ascending colon. In their cases also, calcium phosphate was the cause of the x-ray opacity.

Intestinal Stasis.—This subject has attracted much attention lately, a fact largely due to the x-ray observations and the deductions therefrom of different observers. Jordan[14] lays down the law that the discovery of a static duodenum is a certain indication that other evidence of intestinal stasis exists in the ileum and large intestine, and that, *vice versa*, a normal duodenum is a sign that intestinal stasis is not likely to be present. He is of opinion that the duodenum is undoubtedly the most sensitive point in the alimentary tract, and its indications must be regarded as of the utmost value in diagnosis. Duodenal ulcer is a late stage in the process of bacterial infection owing its origin to intestinal stasis. Hertz[14] on the other hand disagrees entirely with the above conclusions, and in a series of fifty cases of uncomplicated duodenal ulcer has never seen a dilated duodenum or a duodenal kink; and he goes on to say that the constipation (or intestinal stasis) which is generally present in cases of duodenal ulcer, is *not* its cause, as in many cases it only develops after the symptoms of ulcer have appeared, and it almost always disappears as soon as the ulcer heals, whether as a result of medical treatment or of the performance of a gastro-enterostomy. Pfahler,[15] a very acute and reliable x-ray worker, has only seen constriction of the terminal portion of the duodenum three times, and a constriction of the terminal portion of the ileum (Lane's kink) a few times. [Jordan says that "in order to demonstrate ileal kink in these cases of intestinal stasis, no medicine to act upon the bowels must be given for two days previously to the x-ray examination, and that as much as 6 oz. of bismuth carbonate must be given with the test meal." Accepting this, it is obvious that he starts with the large bowel full of food, and that the copious bismuth meal, finding some difficulty in ever getting into the colon, is, so to speak, dammed back in the last loops of the small bowel. Therefore, if this technique is necessary in order to see the kink, and it cannot be demonstrated if the large bowel is first of all cleared out and only the usual 2 oz. of bismuth is given, it seems obvious at any rate that the kink in the ileum has no direct relationship to the stasis, and does not in itself even cause any delay in the small bowel. —C. T. H.]

The Lungs.—The value of a radiographic examination of the lungs in the diagnosis of **Early Phthisis** has been considerably enhanced since the improvement in apparatus has made possible the taking of instantaneous radiographs of the chest. Wenckebach[16] lays special stress on this fact, and also urges the importance of the stereoscopic method. He asserts that the two together have revolutionized the methods of chest examination so far as the prompt diagnosis of early phthisis is concerned. Rivière[17] points out that radiography goes far to confirm the opinion that phthisis is only the final stage of a childhood infection, inasmuch as it discloses as a rule old disease of bronchial and pulmonary glands, and also shows that in these cases the disease appears to spread round the bronchial branches into the lung, and especially towards the apex. He advocates the x-ray examination in conjunction with other methods as helping to confirm the diagnosis in doubtful cases, giving great assistance in determining the extent of the disease, and helping to show whether or not the other side is free.

Lawson[18] says that experience has not only substantiated the x-ray claims of sixteen years ago, but exalted and glorified them, until now it may be said that the consultant who, in the diagnosis of a difficult and obscure lung condition, has not brought them to his aid, has failed alike in his duty to himself and to his patient. In his opinion, in an early doubtful apical pulmonary lesion, a screen examination invariably shows restricted diaphragm movement, less translucency, and a failure to light up at the apex on deep respiration, if early phthisis is present. This paper should be read by all interested in this branch of work, as the author writes both as an expert physician and a radiologist.

Maragliano[20] is of opinion that a valuable *x*-ray sign, especially in cases of small **Pericardial Effusion** is that the pulsation shadow of the inferior border of the heart, when it touches the clear area due to gas in the stomach, almost or entirely disappears. He has tested this in eight cases, and found that after tapping the pericardium, the pulsations could be seen to return after the sac was emptied.

Intrathoracic Aneurysm is discussed in detail by Havilland Hall[21] from all points of view. The paper is well illustrated by diagrams and radiographs of much value, and the diagnosis by radiography is fully mentioned. (*See also* ANEURYSM, INTRATHORACIC.)

Bony Conditions.—Elmslie,[22] under the title of "The Diagnosis of Endosteal Tumours," discusses very fully the *x*-ray appearances in abscess, gumma, cysts, osteitis, enchondroma, and various malignant diseases. A collection of fine radiographs illustrates this paper, and is of especial value in affording the reader the opportunity of comparing the appearances of the various conditions. This paper should be read in connection with another by the same author[23] on fibrous and fibrocystic osteitis. In both communications the *x*-ray findings are described in detail, and the explanation of the site-occurrence of benign cysts of bone, which are much more common than is generally known, is very interesting. It is made quite evident that, whilst a radiograph is often absolutely diagnostic, on the other hand, in many cases great difficulties of interpretation occur, and that sometimes the diagnosis cannot be made by radiography alone. Shoop[24] shows the value of an *x*-ray examination in a case supposed to be osteo-sarcoma of the humerus. The absence of bony structure in the hard mass, together with no thickening or enlargement of the bone itself, pointed to gumma, and though syphilis was denied, antisyphilitic treatment resulted in complete disappearance of the tumour.

In intimate connection with these papers is one by Coley,[25] on **Myositis Ossificans Traumatica**, a full report of three cases illustrating the difficulties of diagnosis from sarcoma. Here again, the radiographs alone might be distinctly misleading, especially those taken at the first examination, and the radiographic interest is that the author publishes *x*-rays showing the condition of the disease at different periods of time. In myositis ossificans, the sharp outline corresponding to the junction of the tumour with the bone, is always present, while in sarcoma it is less distinct, except in the very early stages of the disease.

Skillern and Pfahler[26] maintain that *x*-rays are a great aid in the diagnosis of diseases of the **Sphenoid Sinus**. Pfahler lays stress upon the necessity of good technique and good negatives. Proper interpretation of the plates is essential, and as a rule, disease of these sinuses is associated with an exudate which diminishes their x-ray transparency. Brown[27] also writes upon the same subject, and includes a description of the radiographic changes in diseases of other sinuses, and in the pituitary region. This paper is well illustrated. He is of opinion that the key to success lies in the highest technique and the study of stereoscopic radiographs.

Kidney.—Shenton[28] still maintains that the screen examination is more reliable than plate exposure in the examination for stone in the kidney, and still more so since the introduction of the Snook high tension generator.

Kelly and Lewis[29] recommend a new medium for skiagraphy of the urinary tract, namely, *silver iodide emulsion*. They claim for it that in a 5 per cent solution it is (1) cheaper than collargol, (2) fully as dense as a 10 per cent collargol solution, (3) bland and entirely unirritating, (4) non-staining, (5) stable if the emulsion is well prepared. As it is insoluble in water it must be suspended, and mucilage of quince seed is suggested as the best medium. Reynard and Nogier[30] warn against the possibility of collargol injections leading to a wrong diagnosis, and relate a case where, after the injection, a dark shadow led to the opinion that there was a stone in the renal pelvis. At operation no stone was found, and they suggest that the shadow was due to the extremity of a Malpighian pyramid, rather larger than usual, so situated that it did not allow the collargol to fill the whole of the renal pelvis uniformly.

Pseudo-calculus of the Kidney is also discussed by Ponzio,[31] and various causes are described. The most unusual was a shadow as large as a hazel nut, due to a shell of calcareous matter intermingled with osseous substance, and enclosing a blood clot. Histologically it showed the characteristic structure of a large vein, and it was attached to the inner wall of the renal cavity in a cystic kidney. Ollerenshaw[32] draws attention to the fact that stones may be found in the kidneys of quite young people, and publishes two cases where x rays, and subsequent operation, showed a stone in the kidney of a girl aged 3 years, and in that of a boy of 8 years.

Belfield[33] has incised the vas deferens just above the testicle, injected a collargol solution into the vas and vesicle, and taken radiographs. He claims to have shown (1) A peristalsis of ampulla and vesicle into the prostatic urethra without emission; (2) Sphincteric closure of ampulla and vesicle; (3) A not infrequent occlusion of the ejaculatory duct, converting vas and vesicle into a retention cyst. A 10 to 15 per cent solution of collargol is strong enough, and not more than 4 or 5 c.c. should be injected.

References.—[illegible] *Arch. Röntgen Ray*, 1913, i, 271; *Ibid.* ii, 455, and *Jour. Amer. Med. Assoc.* 1913, ii, 920; *Arch. Röntgen Ray*, 1913, ii, 38; *Ibid.* 98; *Ibid.* 90; *Ibid.* 167; *Ibid.* i, 320; *Bost. Med. and Surg. Jour.* 1913, [illegible]; *Wien. med. Woch.* 1912, Nr. 16; *Amer. Quart. of Roentgenology*, 1913, Feb.; *Med. Chron.* 1913, 188 and 230; *Brit. Med. Jour.* 1913, i, 991; *Arch. of Elect. Med.* 1912, Oct. 25; *Lancet*, 1913, i, 441; *Brit. Med. Jour.*

1913, i, 817; [16] *Jour. Amer. Med. Assoc.* 1912, ii, 1770; [17] *Brit. Med. Jour*, 1913, ii, 415, and *Arch. Röntgen Ray*, 1913, ii, 169; [18] *Brit. Med. Jour.* 1913, ii, 529; [19] *Pract.* 1913, i, 53; [20] *Rif. Med.* 1912, Oct. 19 (*Brit. Med. Jour.* Epit. 1912, ii, 262); [21] *Lancet*, 1913, i, 869; [22] *St. Barts. Hosp. Reps.* vol. xlviii; [23] *Brit. Med. Jour.* 1912, ii, 1367; [24] *Arch. Röntgen Ray*, 1912, ii, 238; [25] *Ann. Surg.* 1913, i, 100; [26] *Jour. Laryn. Rhin. and Otol.* 1912, 507; [27] *Bost. Med. and Surg. Jour.* 1913, i, 882; [28] *Lancet*, 1913, ii, 77; [29] *Surg. Gyn. and Obst.* 1913, 707; [30] *Arch. d'Elect. Méd.* 1912, Nov. 25 (*Brit. Med. Jour.* epit. 1913, i, 35); [31] *Arch. d'Elect. Méd.* 1913, Mar. 25 (*Brit. Med. Jour.* epit. 1913, i, 338); [32] *Brit. Med. Jour.* 1913, i, 112; [33] *Jour. Amer. Med. Assoc.* 1913, i, 800, and *Surg. Gyn. and Obst.* 1913, i, 569.

X-RAY TREATMENT.

Uterine Myomata.—Great advances in the treatment of this condition have been made of late. Gauss and Lembeke[1] have made many experiments, described in full in this paper, on the filtration of *x*-rays; they have also experimented upon animals and plants with filtered and unfiltered *x*-rays. It is interesting to note that, in the case of tadpoles, a definite dose of unfiltered rays which did not kill them, proved deadly when filtered. They deduce from their experiments the fact that it is necessary to use only hard rays to obtain good results in penetration therapy. The principle of their method of treatment is massive filtered doses of *x*-rays from hard tubes from numerous points of entry, and by this means getting cross-fire effects without damage to the skin. Aluminium 3 mm. in thickness is used as the filter. The tube is brought to a focus distance of 20 cm. from the skin. Amenorrhœa is produced within six weeks with absolute uniformity, and with no danger of burns or of late reaction. It is claimed that the treatment can be carried out in five weeks, during which time a dosage of 1480 × is given, and the cures amount to 100 per cent. Gräfenberg[2] is sure that, in addition to the action upon the ovaries, the *x*-rays have a specific action on the myoma itself. He considers that the best results are obtained in cases of interstitial myomata in women past fifty, in whom there are no strong indications for operation. Albers-Schönberg[3] still prefers to treat these cases by smaller doses with the tubes further off the skin, and does not attempt to cut short the duration of time necessary to bring about a cure. He uses two tubes working at the same time, one below and the other above the patient. Each series of irradiations is limited to four sittings of eight minutes each. He now uses, instead of leather, a filter of aluminum 2 mm. in thickness. Many other writers report great success with one or the other of these two methods. For instance, de Boris[4] reports "truly remarkable results," and considers that, supposing radiotherapy fulfils its promises, it ought to be used, since the risks of malignancy on the one hand and operation mortality on the other, are about equal. He points out that at any rate *x*-ray treatment is almost absolutely safe, and that it avoids the shock and other risks and drawbacks of an operation. Runge,[5] with an experience of 93 cases, advocates the method in carefully selected cases, where the diagnosis is certain, and where there is no suspicion of malignant disease or any other contraindication. The report of the discussion[6] on this treatment at the International Congress indicates the views of various well-known workers and should be read by those interested.

Malignant Disease.—Pearce Gould,[7] in the Purvis Lectures on the treatment of **Inoperable Cancer,** refers at length to the value of the gamma radiations. These are given off by both an x-ray tube and radium, and are those rays of the highest penetrating power; and whether produced by the one or the other are, for practical purposes similar, according to Professor Rutherford, and capable of producing similar effects. Radium gives off a number of rays, the most important of which are the alpha, beta, and gamma; the first are entirely absorbed by the thinnest form of filter and in the various methods of using radium are not employed therapeutically; the beta rays are of two sorts, those of very low penetrating capacity and those of higher; the former are again cut out by all the usual filters, the latter are of some therapeutic value and will pass through thin metal filters. In order to cut them out entirely, filters of lead of 3 mm. thickness are used, and when placing these between the radium and the parts exposed to treatment, only the high gamma rays pass through for therapeutic purposes. In the treatment of deep-seated malignant growths when radium is applied for from many hours to even many days continuously, this thick filtration is necessary for safety, and the full use of the gamma radiation can be obtained. It is much the same with x-rays, but the difficulty here is, firstly, to keep an x-ray tube in the very hard condition for the best production of the high penetrating rays for the length of time necessary to make an effectual exposure; the second difficulty is in the application. Exactly in the same way, filters must be used to cut out the softer and less penetrating rays; and with x-rays aluminium in various thicknesses has been found the most practical. Used in thicknesses of from 3 to 5 mm. it is possible, without damage to the skin, to give very large x-ray dosage to deep-seated growths; but the tube and apparatus require careful watching the whole time, thus differing from radium, which will go on indefinitely without changing its radiation in any respect. Admitting all this, there is no doubt but that some cases react favourably to x-rays and are a failure with radium, and vice versa. Why this should be so is not known, but probably want of knowledge of the best method of filtration, and the exact dosage required, is at the bottom of the failures in either case. Different sites are easier of treatment by one or the other, and without going into detail it may be said that radium is infinitely superior to x-rays for such conditions as **Cancer of the Rectum, Uterus, Œsophagus,** and so on; whilst the prophylactic post-operative treatment of a large area, such as is necessary, say, after the **Removal of a Breast** and the clearing out of the axilla, is more favourable to treatment by x-rays. Sometimes a combination of the two will bring about the best result, such as for instance the burying of radium in tubes in a growth, or in a mass of secondary glands, followed up by hammering away with frequent external applications from an active *x*-ray tube. To quote the author: "Of the treatment of these cases by the gamma radiations produced by an *x*-ray tube or radium, I can speak with much satisfaction. These radiations can undoubtedly inhibit cell growth, and they seem to have a special power over cancer and sarcoma cells, and, more than this, they have the power of destroying malignant cells." Testimony of this kind is of special value when coming from such an acknowledged authority.

Pfahler[8] has done a large amount of work in this direction, and writes with authority and reserve. He reports his results in twelve cases of **Inoperable Breast Carcinoma,** and gives each case fully. His results in the directions of relief of pain, reduction in the size of the growth, improvement in general health, and prolongation of life, are remarkable. He lays stress upon the facts that no other method of treatment has ever accomplished as much in the class of cases referred to in this paper, and that the treatment should be carried out by one expert in technique. Cumberbatch[9] reports a case of recurrent breast carcinoma in which, after three months *x*-ray treatment, numerous "melon-seed" bodies scattered under the skin of the axilla and breast all disappeared. A point about his result worth noting is that this was brought about by quite small dosage, half to one S unfiltered, given once a month. In contradistinction to this small-dose method, Mackee and Remer[10] advocate massive *x*-ray doses in **Cutaneous Epithelioma.** A very thin filter—a single layer of chamois leather—is employed, and a dose of 5 to 7 H of a B 6 ray administered. Many of the cases were cured with a single dose; few had more than two. The authors aim at, and think it beneficial to produce, a first degree of radio-dermatitis.

Closely allied to this subject is the *effect of radio-active substances and radiations upon normal and pathological tissues*, in a discussion on which Lazarus-Barlow[11] gives an account of his recent researches. An interesting observation was that gall-stones from non-malignant cases or cancer, excluding gall-bladder cancer, were not unusually free from radio-active matter, whilst in no single instance had the gall-stones from cancer of the gall-bladder failed to give evidence of a relatively considerable amount. Hertwig also showed that while full grown and differentiated cells and tissues are comparatively little affected, on the contrary, embryonic cells and others which in adults lingered in an undifferentiated state, especially generative cells, young nerve cells, leucocytes, and tumour cells in a state of growth, were especially sensitive to radio-active substances.

Myeloid Leukæmia.—Béclère[12] irradiates the whole spleen through aluminium filters, dividing the region into segments, so that each portion of the spleen receives the same dose. A very short period of treatment, two to three months, is sufficient in most cases to change the blood condition completely, the most constant feature being the decrease of the number of white corpuscles. The first phenomenon is the rapid disappearance of the nucleated corpuscles, whilst the megaloblasts and young cells disappear early. That complete cure does not take place is shown by the fact that solitary myelocytes persist; however, the author is aware of cases still well, five or six years after x-ray treatment. Petrone and Lore[13] record eight cases of **Infantile Splenomegaly** treated by x rays. In four cases of pseudo-leukæmic splenic anæmia the size of the spleen was reduced and leucocytes diminished. In one similar case, and in a case of Leishmaniasis, whilst the size of the spleen and the number of white corpuscles diminished, the condition got worse and death followed. There are certain *dangers* in this treatment, and Cumberbatch[14] calls attention to these in relating a case of fatal leucopenia under his care. Full blood counts are given and an attempt is made from these to indicate the danger signals. [It is possible, however, that in this case the result was not directly due to the x-ray treatment, but to some secondary septic infection, inasmuch as the rapidly fatal stage was accompanied by an inflammatory condition of the throat.—C. T. H.].

Zimmern[15] and Cottenot[15] carried out a series of experiments on patients suffering from **Arterial Hypertension**, and brought about a reduction in almost all by irradiation of the suprarenal region. The technique is simple, the suprarenal capsule being always in a definitely fixed position. Make the junction of the twelfth rib with the vertebral column the centre of the irradiated area, and the suprarenal gland will be reached. Protect the neighbouring organs with metal, leaving an opening for the x rays, and line the metal (lead for preference) with a layer of felt next the skin. Hard rays should be used, 9 to 10 on the radiochromometer, and these should be filtered through 1 mm. of aluminium. Irradiate both glands, one after the other, placing the tube 15 to 20 cm. from the skin. The kidney itself receives some part of the irradiation, but this does not appear to be injurious. The authors have analyzed the urine, and have found no trace of albuminuria consecutive to the treatment. The dosage and number of exposures can be regulated according to the results. In some cases there was a lowering of 3 to 4 cm. Hg within forty-eight hours of the sitting, and in several patients the results were maintained for months without further irradiation.

Sciatica. Louis Delherm[16] has treated cases since 1909 by Röntgen therapy, and reports diminution of pain in nearly all. He urges that this treatment should be used when the galvanic current has failed, and especially in those cases in which the sciatica is due to some compression of the root of the nerve. Small x-ray doses are recommended, in three separate instalments at intervals of a week, the total dose of each series to be 5 H of 6 Benoist hardness through ½ mm. of aluminium. The irradiation is to be directed on to the sacral region and on the painful points in the course of the nerve.

Chronic Adenitis.—Max Kopp[17] is much impressed by the results of x-ray treatment in chronic glandular conditions due to micro-organisms, the æsthetic result being superior to that obtained by operation. He describes his technique. He employs one of three methods of dosage, but usually administers a massive dose at one sitting, followed by a rest of from twenty to twenty-five days. Fibrotion by means of aluminium should always be carried out. He obtains good results, not only in superficial glandular enlargements but also in intrathoracic and intra-abdominal adenitis. [From our own experience of the *x*-ray treatment of masses of enlarged glands in the neck, we are convinced that, combined with incision into breaking-down foci, this treatment is preferable to excision.—C. T. H.]

In regard to **Adenoids** and **Enlarged Tonsils,** Stewart[19] noticed that in those cases where there was also glandular enlargement, *x*-ray treatment of the latter condition also brought about diminution in the size of the tonsils. Following this observation, he has treated several cases of enlarged tonsils with promising results, and in no case was there any failure of reaction. Sometimes only two or three doses brought about great relief to the symptoms.

Precocious x-ray Reactions have been noticed by Marques[20] as attributable to the action of *x*-rays on the salivary glands. A few hours after the exposure, a swelling sometimes appears at the irradiated region, and even takes on a character suggestive of epidemic parotitis. In one case, after a feeble dose, the same evening the patient complained of difficulty in mastication and deglutition; the region was hot and tender, and the next morning there was considerable tumefaction. A second treatment, and a third, produced similar results. Pfahler[21] has seen the same phenomenon when treating a case of acne below the ears. He suggests that it is in some way due to the electrostatic discharge which develops in the neighbourhood of the excited *x*-ray tube when it is close to the tissues, and that it is probable that other *primary* reactions which occur immediately after an *x*-ray exposure are due to the same cause. If this is the case, they can be prevented by the simple means of surrounding the area with earthed metal. Regard,[22] however, believes that syphilis plays an important rôle in the abnormal reactions which occasionally follow radio-therapy in spite of the most careful technique. He treated a case of bad freckling of the hands with two very feeble applications of *x*-rays; twenty-seven days later a severe radio-dermatitis developed, and left in its train an ulcer the size of a two-franc piece on the back of each hand. Syphilis was at the time energetically denied; but later on the patient, the ulcers having in the meantime healed, developed symptoms of general paralysis, and shortly afterwards died, having also admitted old syphilis.

Hernaman-Johnson[23] has tried *x*-ray treatment in two cases of **Chronic Progressive Diseases of the Spinal Cord,** with promising results as far as amelioration of the symptoms is concerned. He suggests that two effects are produced: (1) A depression of the unhealthy neuroglia cells; (2) Stimulation of such neurones as are not too deeply injured to respond. In both cases, on stopping irradiation, relapse took place, followed by improvement on recommencing. Probably it is not feasible to hope for more than to hold the degeneration in check; i.e., the patient must lead an "*x*-ray life" comparable with a "thyroid life" in cases of myxœdema. In **Syringomyelia** marked improvement may be looked for. Marques and Roger[24] irradiated a case every other day with 3 to 4 H units filtered; at each sitting the rays were directed upon a different part of the spine. After thirty-four doses there was marked amelioration, with an increase of tone and voluntary motility. The troubles of sensibility were alleviated, and the trophic changes disappeared.

Purpura.—Triboulet, Weil and Paraf[25] rapidly cured a case of this disease with four x-ray doses, two to the spleen, and one to each femoral diaphysis. The patient suffered from purpuric patches, vomiting, abdominal pain, and epistaxis. This is the first case of this kind reported as being cured by x rays. Small doses are advised; in this case the maximum at each irradiation was 2 H, and it is suggested that this mild dose stimulates the cells of the hæmatopoietic organs.

The x-ray treatment of **Hypertrichosis** seems to be emerging from the discredit into which it had fallen. Spéder[26] follows a technique in which hard rays, 7 to 8 Benoist, are employed filtered through 1 mm. of aluminium. A maximum safe dose is given. The hair fell out in from twelve to twenty-five days. From seven to nine weeks after the first dose the hair begins to grow again, and a second similar dose is given. In two or three months after this a third, slightly smaller, dose is given. Rarely is it necessary to do more than this. The writer warns against applying this treatment to an undue development of merely downy hair. It is not suited to such condition, and should be reserved for large vigorous hairs which have a much greater radio-sensibility. He advocates the use of shaving or depilatory pastes to attempt to change downy growth into true adult hair and, when this is accomplished, to cure the condition with x-ray treatment.

Haldin Davis[27] calls attention to the fact that little has been published in this country on the treatment of eczema by x rays. He has treated three cases of **Eczema and Psoriasis of the Palm** of a very chronic character with great success. A lady of 68 had suffered for thirty years with fissured eczema of the palm of both hands. Two doses of approximately two-thirds of a pastille each resulted in disappearance of the eczema and fissures and practical cure of the irritation. [These cases in their reaction to x rays are similar to those of chronic irritation (itching) round the anus and vulva. In these cases it is remarkable how a few small, unfiltered x-rays doses will almost immediately cure a patient completely whose sufferings for years have been almost intolerable, and who has forgotten what a good night's rest means.—C. T. H.]

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Ray. 1913, ii, 38; [18]*Arch. d'Élect. Méd.* 1912, July 25 (*Brit. Med. Jour.* Epit. 1913, i, 180); [19]*Brit. Med. Jour.* 1913, i, 1157; [20]*Arch. d'Élect. Méd.* 1912, Aug. 25 (*Brit. Med. Jour.* Epit. 1913, ii, 30); [21]*Jour. Cutan. Dis.* 1913, June (*Arch. Röntgen Ray*, 1913, ii, 103); [22]*Arch. d'Élect. Méd.* 1912, Sept. 25 (*Brit. Med. Jour.* Epit. 1913, i, 259); [23]*Brit. Med. Jour.* 1913, ii, 299; [24]*Arch. Röntgen Ray*. 1913, ii, 162; [25]*Bull. de la Soc. de Péd.* 1912, Nov.; (*Brit. Med. Jour.* Epit. 1913, i, 237); [26]*Brit. Med. Jour.* Epit. 1912, ii, 342; [27]*Ibid.* 1913, i, 1053.

RADIUM AND ALLIED SUBSTANCES.

The most important publication this year was *The Report of the Work of The Radium Institute*, by Hayward Pinch,[1] and this should be studied in detail for the facts given concerning the methods of using the radium and the results obtained. Covering a period of nearly seventeen months, it deals with the results of 578 cases. These were not selected in any way, and equal prominence is given to cases in which radium appeared to be useful and those in which it had been useless or possibly harmful. In short, one object of the report is to point out the conditions under which radium is of no therapeutic value. Nothing could be better than the fair manner in which the report deals with all classes of disease, and it is very notable that the word "cure" is not used in relation to malignant disease, although in many of the cases it would seem justifiable to have said that cure had resulted. The author of the report, however, contents himself with the term "apparent cure." We would refer the reader to this paper for the details of appliances, and the methods of application, dosage, etc.

Rodent Ulcer is a disease most amenable to treatment by radium, and this applies with added force to the ulcers of large area. Cases are quoted and described in which other methods of treatment failed, and in which radium produced most markedly good results. Whatever may be said as to the method of treatment to be applied to small rodent ulcers, there seems to be no doubt that nothing is so effectual as radium in the large and inoperable ones.

In **Carcinomata of the Rectum** and of the **Breast**, promising results are noted. In **Carcinoma of the Uterus,** inoperable cases may be made operable, hæmorrhage is arrested, discharge diminished, ulceration healed, and pain greatly relieved. No other known method of treatment will bring about some of the results obtained. In **Epitheliomata,** very different results are obtained in those affecting the glabrous skin from those involving mucous surfaces. In the former the action of radium is most favourable, but in epitheliomata of the tongue, buccal, gingival, and pharyngeal mucous membranes the effect is almost uniformly disappointing. Conditions more amenable to the action of radium are epitheliomata of the vaginal and uterine mucosa.

Sarcomata are best treated by the insertion into their centre of tubes containing as much as 50 to 100 mgrams of radium, and these, screened with from 0·5 to 1 mm. of silver, can be left in position for from twenty to thirty hours; this frequently proves most effective; the tumour shrinks in size, and becomes replaced by dense fibrous tissue.

A noteworthy feature of the report is the appendix, the report of the Chemico-physical Laboratory by W. L. S. Alton, which deals fully with the various applicators, the measurement of activity, the screens, the secondary rays, etc., and is full of important and valuable hints as to the rationale of the treatment in addition to the actual technique.

Robert Knox[2] publishes a thoughtful paper on the results of his experience at the Cancer Hospital. He thinks the claim that radium possesses a "selective action" on cancer cells is a bad description of its effects. It acts on all living cells according to the resistance of the particular cell in question; young and actively growing cells are more readily influenced than mature cells, and the cells of a new growth, approximating in structure and resisting power to these, are so much the more readily subject to the action of radium. The factors influencing the result of treatment are: (1) The type of growth and the condition of the patient; (2) The situation, size, etc., of the tumour; (3) The quantity of radium used; (4) The filtration employed; (5) The duration of the exposure. He concludes that radium is a useful adjunct to the treatment of all cases: first as a prophylactic after operation, and, failing operation, the next best method we possess. It must, however, be stated that X rays are in selected cases quite as useful. In inoperable cases, radium may help to render the case operable; and, failing that, it is undoubtedly useful as a palliative measure.

Dawson Turner[3] has treated 41 patients during the year 1912, and finds radium most beneficial in **Nævus** and **Rodent Ulcer.** One port-wine stain was cured. In 12 cases of malignant disease his results are not encouraging, although one case of recurrent epithelioma of the ala nasi was completely successful, and in three other cases there was improvement.

In a paper on **Inoperable Cancer** treated by radium, Warden[4] details some of his experiences, and regrets that so many cases are allowed to reach such an advanced stage before being sent for treatment. "When we cause an epithelioma that has been known to exist for a year or more to disappear entirely, and when a few months later the patient dies from a metastatic growth, we have a just claim that the action of radium on cancer is demonstrated, and that the secondary growth, had the radium been used earlier, might never have occurred." He gives details of several striking cases, some apparently hopeless, and in every case marked relief to the sufferings of the patient was effected.

M'Kendrick and Teacher[5] discuss a case of **Cancer of the Throat,** in which the action of radium was followed for a time by such marked improvement in the local conditions that the possibility of recovery did not seem remote, when unfortunately, septic infection and hæmorrhage caused death. A post-mortem examination showed that whilst all the main pharyngeal growth had been destroyed, and healing of the mucous membrane had taken place over the whole area, a small portion of the tumour had reasserted itself in the soft palate, and malignant tissue was found lower down in the neck. In this instructive case large amounts of radium were inserted for as long as forty eight hours into operation wounds.

In **Cancer of the Stomach**, Julien[6] has had success in two cases. In one, in which there was extreme cachexia and a tumour the size of an orange in the pyloric region, after laparotomy a tube containing 1 cgram of pure radium sulphate placed in a Nélaton's soft rubber catheter was introduced and left in position for fifty hours upon the tumour, two other tubes of 1 cgram each being placed upon the abdomen. In ten days the tumour had disappeared to palpation. In a second similar case two similar tubes were introduced and applied for seventy-five hours, whilst six applicators of various strengths were applied outside. A month later the external treatment was repeated. In a few months the tumour had gone, after a third external dosage, and the patient resumed a normal life.

A case of **Inoperable Cancer of the Cervix Uteri** is interesting from the fact that definite proof of the cure is complete. Chéron and Rubens-Duval[7] record this case. The tumour, squamous epithelioma by microscopic examination, was treated by the implantation of 20 cgrams of radium in several tubes for forty-eight hours. Later, 7 cgrams were similarly used for twenty-four hours. The patient died from cerebral hæmorrhage two and a half years later, and no trace of malignant growth was found at the autopsy. Numerous sections of the cervix and right broad ligament were examined microscopically, and not a single cancer cell was found. Aikens and Harrison[8] also report three similar cases of very advanced and inoperable malignant disease, and in each, in addition to marked amelioration of symptoms, there was definite retrogression of the disease and disappearance of ulceration.

Into a recurrent small-celled **Lymphosarcoma** of the neck, Dawson Turner[9] introduced a glass tube containing 20 mgrams of the bromide, and left it in position for thirteen days, at the same time applying 40 mgrams externally for four hours daily over different areas. The total internal dose amounted to 6240 mgram hours, the external to 8680 mgram hours. After a further operation, a tube was introduced into the cavity left, the dose being 3360 mgram hours. No trace of the disease could be found three months later, and after a year had elapsed, the patient remained quite well.

Degrais[10] records three cases of **Rhinophyma** successfully treated by radium. Two were of the glandular and one of the elephantiac variety. In all, the abnormal secretion and congestive phenomena disappeared little by little, and the hypertrophied tissues sank down. Full details of the technique are given.

The action of radium on **B. lepræ** is described by de Verteuil,[11] who applied 80 mgrams of the bromide to leprotic nodules for one hour. The nodules were reduced in size, but marked changes also took place in the appearance of the bacilli present in them. For thirteen days no change was found, but after this increasing granular degeneration was marked, until after four weeks no bacillus could be seen. The suggestion is that as there was no apparent action before fourteen days, the bactericidal effect was not direct but exercised through some chemical process on the tissues. If it were possible to radiate all the tissues of the body with radium rays it might be a cure for leprosy. Possibly the drinking of large quantities of radium water might be effective.

In four cases of **Exophthalmic Goitre**, Dawson Turner[12] reports that there was a distinct amelioration of the symptoms. The author claims that the two advantages of radium over x rays in this disease are: (1) That a definite dose can be administered and repeated; (2) That radium can be applied without noise or excitement whilst the patient is in bed. It is probable that the effect of radium on the thyroid gland is to diminish vascularity and leucocytosis, and to cause an overgrowth of connective tissue.

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ELECTROTHERAPEUTICS.

Finsen Light.—Sequeira[1] gives a full account of the results of this method of treatment as carried out at the London Hospital from 1900 to 1913. The highly satisfactory character of the results in **Lupus** is shown by the statistics: 99 cases have been free from recurrence for ten years and upwards, 277 for from five to ten years, and 108 for from three to five years. These results speak for themselves. 117 patients have been cured, but there have been small recurrences. 161 cases have derived benefit, but are of such a character that they have never been and probably never will be quite free from the disease. 81 patients are classed as hopeless, the disease being not materially influenced. 127 cases have for one reason or another not persevered. The author points out that the whole of the benefits cannot be ascribed to Finsen light, as no other means of help—operation, etc.—have been neglected, but admitting this, the bare record of cases and results is proof positive of the powerful action of the Finsen treatment. Sequeira has no doubt but that to the devotion and care of the sisters and nurses a large amount of the success is due, and this means that to get the best effect of the treatment it must be carried out in a systematic manner with the accompaniment of the best skill and technique.

The Galvanic Current.—Cheriton[2] strongly advises this in the treatment of **Chilblains.** He has obtained uniformly good results in both relief and the prevention of recurrence. The technique is to place the hands and feet in two baths of saline water into which the galvanic current is directed at whatever intensity it can be supported, covering the more irritating spots with collodion in the first place. Treat for twenty minutes daily for as long as is necessary, passing the current in one direction for the first ten minutes and reversing it for the second. Itching will diminish or disappear from the first.

Incandescent Light.—Laquerrière and Loubier[3] recommend this for obstinate cases of **Atonic Wounds.** Daily exposures of from twenty to thirty minutes to a 32-candle-power lamp placed in a reflector, healed wounds which had failed to respond to other methods of treatment. As instances of the deeper action of "luminotherapy" and the trophic character of the radiations, the authors cite two cases of osseous rarefaction, in an index finger and in an astragalus, both of which improved considerably under this simple treatment. If white light causes irritation, they advise that the glass shall be tinted blue.

Ultra-violet Radiation has bactericidal properties, and can be utilized for the sterilization of drinking water, etc. A system has been introduced into some French and Indian towns. Recklinghausen[4] describes the technique adopted, which is to place the quartz-mercury-vapour lamp in close proximity to the passing water; and for domestic use (hospital or private), 130 gallons can be sterilized per hour.

High Frequency Currents.—Somerville[5] speaks highly of the beneficial results obtained in **Trigeminal Neuralgia,** and insists on the necessity of skilled supervision, and of perseverance. He quotes a striking case of long duration and much severity, in which cure was rapid and apparently permanent. In addition, he has treated many cases of neuralgia of all degrees of severity, in which relief and often complete cure has resulted.

REFERENCES.—[1]*Lancet,* 1913, i, 1655; [2]*Arch. d'Elect. Méd.* 1913, Feb. 25 (*Brit. Med. Jour.* Epit. 1913, ii, 125); [3]*Ibid.* 1912, Nov. 25 (*Brit. Med. Jour.* Epit. 1913, i, 19); [4]*Brit. Med. Jour.* 1913, i, 464; [5]*Ibid.* 1912, ii, 1706.

IONIC MEDICATION.

Ionic medication is defined by Dr. Lewis Jones as a method of treatment in which electric currents are used for their power of setting the constituents of a saline solution in orderly motion in a definite direction. This definition is sufficiently broad to embrace all the ionic actions used in medicine, for the tissues of the human body differ in no respect from ordinary saline solutions in their conductivity of electricity.

All substances fall naturally under three headings as regards electrical conductivity: (*a*) *Conductors,* (*b*) *Non-conductors,* (*c*) *Electrolytes.* To the third class belong most of the drugs used in medicine, and a member of this class of substances has the property of allowing an electric current to pass through aqueous solutions, but only at the expense of its own dissociation, or electrolysis as it is called. Physicists have now clearly shown that when a body of this class, for example sodium chloride, is dissolved in water, many of its molecules are at once dissociated and split up, free atoms of sodium and free atoms of chlorine making their appearance in the solution. The free sodium atom carries a positive charge of electricity upon it, while the free chlorine atom carries a negative charge. These free charged atoms are called *ions* (i.e., travellers), and it is to the presence of ions that the solution of an electrolyte owes its conductivity, for pure water is a very bad conductor indeed.

If into this solution of sodium chloride two electrodes, attached respectively to the positive and negative poles of a battery, be introduced, the positively charged sodium ions which lie near the negative electrode will be at once attracted by it and will give up to it their positive charge; while the negatively charged chlorine ions will be repelled by the negative electrode and driven off into the liquid towards the positive electrode. At the positive electrode the negatively charged chlorine ions will be attracted and give up their negative charge, while the positively charged sodium ions will be repelled and driven off through the liquid towards the negative electrode. The net result will be a steady stream of ions across the liquid, a transference of electricity from one electrode to the other, and the appearance at either electrode of free uncharged atoms or groups of atoms, which must be clearly distinguished from the charged atoms or ions. The current will flow from the positive to the negative electrode in the liquid; and it will be seen that the positive sodium ions move in the direction of the current stream, and are therefore called kations, because they travel down stream, while the negatively charged chlorine ions move against the current, and are therefore called anions, because they travel up or against the stream.

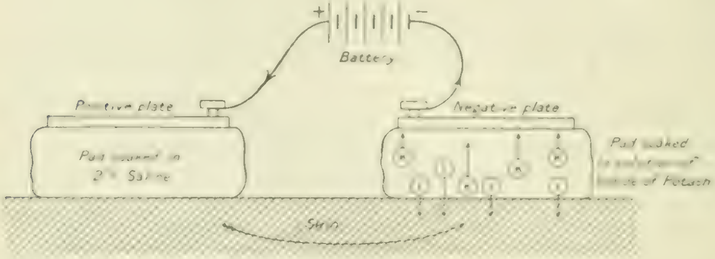

Fig. 1.—Ionization with potassium iodide.

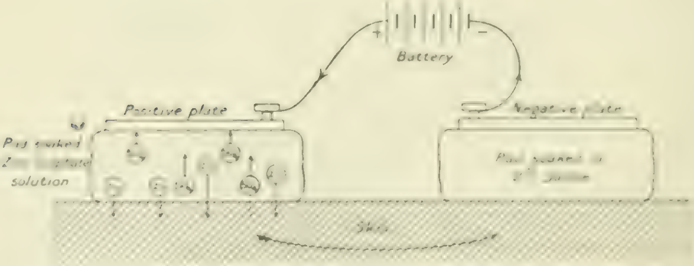

Fig. 2.—Ionization with zinc sulphate.

As the human tissues act towards an electric current in a manner similar to the saline solution, a convenient method of introducing drugs into the body at once presents itself. For instance, it is desired to introduce iodine into the tissues at a certain point. If a folded piece of lint soaked in iodide of potassium be placed over the part, and a plate attached to the negative pole of a battery be applied, while a similar piece of lint moistened with saline solution and connected to the positive pole of the battery is placed upon some other part of the body, the iodine ion from the pad attached to the negative pole will be driven into the tissues under the lint, while sodium, potassium, and other kathions will pass from the skin into the iodide pad. The diagram (*Fig.* 1) will make this clear. Similar actions will at the same time be going on at the positive pole; but in this case the positive pole has simply acted as an entrance for the current, and we are not concerned with what may be taking place there. Iodine introduced in this way does not enter the blood-stream, as it must do when given by the mouth, but is directly introduced into the cells and lymph-spaces, and reaches the cell in a far more concentrated form than can be achieved by any other method of medication. *Fig.* 2 represents in a similar way the introduction of zinc ions under the positive plate.

The dose of an ion introduced by any current is capable of very accurate measurement, and the following table shows the pole at which various ions must be introduced, and the dose of each which will be administered, if one milliampère of current be allowed to run for one minute.

Anions, which must be applied at the negative pole:—

Bromine	..	·049	mgram	NO_3	..	·04	mgram
Chlorine	..	·022	,,	P_2O_5	..	·016	,,
CO_3	..	·019	,,	Salicylic Acid	..	·085	,,
Hydroxyl	..	·01	,,	SO_4	..	·029	,,
Iodine	..	·078	,,				

Kathions, which must be introduced at the positive pole:—

Ammonium	..	·003	mgram	Potassium	..	·024	mgram
Calcium	..	·012	,,	Quinine	..	·234	,,
Cocaine	..	·18	,,	Silver	..	·06	,,
Gold	..	·04	,,	Sodium	..	·014	,,
Hydrogen	..	·0006	,,	Strychnine	..	·207	,,
Lithium	..	·004	,,	Sulphur	..	·01	,,
Magnesium	..	·007	,,	Zinc ..	..	·02	,,
Mercury	..	·062	,,				

That drugs can be introduced deeply into the tissues by this method of electric propulsion there is no doubt. Finzi, experimenting with ferrocyanide ions on the knee of a monkey, and using a current of 10 milliampères for thirty minutes, was able subsequently to demonstrate the presence of the drug in the cartilage of the joint. Gautier also succeeded in driving copper ions through the uterine wall of a rabbit 1 mm. thick in ten minutes with 20 milliampères of current.

Practical Points in the Application of the Method.

1. The pads which are interposed between the pole plates of the battery and the patient's skin must be of considerable thickness (ten to twenty layers of lint or several thicknesses of Gamgee tissue). If this point is not attended to, the alkali or acid produced where the current passes from the metal plate to the pad, or *vice versa*, may penetrate through the pad and damage the skin.

2. The solution used to moisten the pad which is to supply the ions to be introduced into the tissues must obviously be a solution which contains the desired drug in the form of ions. In other words, the solution must contain an electrolyte. A solution of carbolic acid or sugar would be useless to moisten the pads with, because the molecules of neither are dissociated to form ions.

3. The pads must be well wet with the solution, and must be applied in thorough contact with the skin and held in position firmly with a bandage or rubber bands.

4. The pads must be washed free of solution after each treatment, and soaked again in a fresh solution of the drug for the next application. There are two reasons for this procedure: the solution becomes weakened in ions by use, and the acids and alkalies already mentioned accumulate and may become dangerously concentrated on the pad after a few applications.

5. Care must be taken that the current is running in the correct direction to introduce the particular ion which is in use. If a kathion is being used, it must be placed under the positive pole; if an anion, it must be placed under the negative.

6. A milliampèremeter must be used to measure the strength and variation of the current, and some form of rheostat must be employed in the circuit, in order that the current strength may be slowly and evenly brought up to the desired intensity without unpleasantness to the patient.

7. The strength of the solutions used for the pads need not be very great, 1 per cent being suitable in some cases; 2 per cent is a useful strength for iodide of potash and sulphate of zinc; the latter can, however, be used in a strength of 10 per cent if a deeply caustic action is desired. A 2 per cent solution of salicylate of soda is a convenient strength when the salicylate ion is to be introduced.

8. The strength of the current which can be employed will depend largely upon the size of the pads applied to the skin; a strength of 3 milliampères per square centimetre of surface being usually borne quite comfortably. If strong currents are to be used large pads are an essential.

9. The source of electric supply may be: (1) Some form of dry cell. Such cells are handy, but seldom can be relied upon for more than a year. A battery of at least twelve cells, giving 18 volts, will be needed. (2) Wet Leclanché cells, such as are used for electric bells. These serve well for use at home, but are not portable. (3) One of the many instruments at present manufactured, in which a current is drawn

from the windings of a motor worked from the lighting mains, of which the multostat and the pantostat are examples. (4) Direct from the lighting main, with a suitable resistance on circuit to control the strength of the current. If the main current is used, care must be taken that the patient is thoroughly insulated, as otherwise dangerous shocks may result.

Ionic medication yields satisfactory results in the following diseases: Lupus,[1] rodent ulcer,[2] simple chronic-ulcer, [3],[4],[5], diphtheritic ulceration, [6],[7], ophthalmia neonatorum,[8] trachoma,[9],[10], ulceration of the nose,[3] ozæna,[11] antral suppuration,[12] rectal ulceration,[13] anal fissure,[14] piles,[15] colitis,[16] enlarged prostate,[17] gonorrhœa[9],[18],[19], vaginitis,[20] endometritis,[21],[22], boils, carbuncles and sycosis,[23] ringworm,[24] warts,[25] corns,[26] alopecia,[27] gout, [28],[29],[30],[31], neuralgia,[32],[33], sciatica,[34],[35], rheumatism, acute and subacute,[36],[37], rheumatoid arthritis,[38] gonorrhœal arthritis,[39], acne,[40] psoriasis,[41] branchial fistula.[42]

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THORIUM.

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At present we know of three groups of radio-active elements: the uranium group to which radium belongs, and the actinium and thorium groups. Thorium oxide was discovered in 1828 by Berzelius, who was afterwards able to classify metallic thorium among the alkaline earths. Its atomic weight is 232·5, and the minerals which yield most are uraninite, containing 4 to 11 per cent thorium and 64 to 74 per cent uranium, and thorianite containing 64 to 74 per cent uranium and 4 to 11 per cent thorium. These minerals, rich in thorium, are principally derived from Ceylon. Of greater importance, however, is monazite gravel, from which mesothorium is derived. In this mineral, which is rich in cerium salts, mesothorium is mixed with thorium oxide and also always with uranium salts. Commercially, it is derived from monazite as a by-product in the manufacture of the Auerlicht incandescent mantle. Mesothorium, and its near relative radiothorium were discovered in 1907 by Hahn, who recognized their high radio-activity.

Like the members of the other radio-active groups, the elements of the thorium family possess the faculty of becoming converted into new elements with lower atomic weights by giving off "rays." As in the case of uranium and radium, so also with the members of the thorium series three types of "rays" have hitherto been found. These types, which are quite different from each other, are: (1) The "alpha" rays, helium atoms, which carry a positive electrical charge; (2) The "beta" rays, which are electrons, or the minutest of units of negative electricity; (3) The "gamma" rays, which are not material particles at all; they are regarded as similar to light, electro-magnetic oscillations in ether. They are not known to possess any electrical charge.

Of the greatest importance in relation to their practical value, is the rapidity with which this dissolution takes place. As a measure of the the "half-value time" has been chosen; i.e., the time which a certain quantity of radio-active substance takes to convert half of itself into the next member of the series, by sending forth the characteristic radiations. These periods vary enormously, as the following table shows:—

THE THORIUM GROUP.

Half-value period	Element	Rays
1,000,000,000 years	Thorium	α
5·5 ..	Mesothorium I	—
6·2 hours	Mesothorium II	β, γ
2·0 years	Radiothorium	α
3·65 days	Thorium-x	α, β
53 seconds	Thorium emanation	α
0·14 ..	Thorium A	α
10·6 hours	Thorium B	β
60·5 minutes	Thorium C	α, β
3·1 ..	Thorium D	β, γ

Since the activity of radio-active substances is proportional to the number of rays given off in a unit of time, thorium, with its infinitely long period of dissolution, is of no importance as a radio-active body. Practical interest begins with mesothorium formed from thorium after millions of years.

The mesothorium on the market is not a pure substance. It contains radium in the proportion of 3 to 1; so far it has not been possible to separate the radium from the mesothorium. In addition to the pure mesothorium I (in the chemical sense of the word), all the lower members of the thorium series (mesothorium II, radiothorium, etc.) are present, as well as a considerable proportion of inactive substance. One hundred mgrams of commercial mesothorium contain ·25 mgram of mesothorium, with the radiant energy of 75 mgrams of radium bromide; 25 mgrams of radium (in terms of the bromide), with the radiant energy of 25 mgrams of radium bromide; and 74·75 mgrams of inactive substance.

As mesothorium wastes infinitely faster than radium (in the ratio of 5·5 to 1800 years), so the energy which it emits in a unit of time is much greater than that of radium, at all events with the fresh substance; 1 mgram of fresh commercial mesothorium has a radiant energy equivalent to that of 300 mgrams of radium. The value of mesothorium is not according to its weight, but is expressed thus: 100 mgrams of mesothorium preparation have the energy value of x mgrams of radium bromide. To find this total involves a complicated explanation of physical technique, which cannot be entered into here. The total must be known in order to calculate exactly the amount of the preparation and the time of application which are necessary. For example, if one reads that to obtain good results in the treatment of a rapidly-growing uterine cancer 20,000 mgram-hours distributed over twenty days are necessary, and the mesothorium preparation in one's possession is equal in value to 100 mgrams of radium bromide, the preparation must be left in contact with the diseased tissues for quite 200 hours, or an average of 10 hours daily.

As a consequence of the peculiar distribution of the radio-active substances in commercial mesothorium, it reaches its maximum of radioactivity about three years after its initial preparation; the activity is then gradually dispersed, and reaches its original grade once more at about the tenth year; after another ten years it possesses only half its original energy. By this time there is not much left of the thorium series of radio-active substances, and such radio-activity as it still possesses is due to the radium included in it. This may be regarded as constant in relation to the span of human life, for its half-value time is 1800 years.

It is the mesothorium mixture that is used, a substance which as a whole is not soluble. For special purposes the preparation is enclosed within capsules of celluloid, or other material penetrable by the radiations, and deposited in the body cavities (vagina, uterus, bowel, œsophagus, etc.), or in tumours. The duration and number of applications are regulated by the special circumstances of the case. As a rule it is to act upon the depths of the tissues; if we apply it, we have often to enclose it within thin sheets of lead or aluminium, to filter off the injurious alpha-rays and prevent the burns which have become well known and dreaded in connection with x-ray work. This metal filter transmits part of the beta-rays and the whole of the gamma-rays. Or the mesothorium may be mixed with indifferent substances, such as tonschlamm, fango, or organic material, sewn up in small bags and applied to the appropriate part. For special purposes various well-devised methods have already been evolved, and it is important to refer to the collected works on this subject, in order to ensure a maximum of beneficial activity with a minimum of risk. In the journal *Strahlen Therapie* (vol. iii, H. 1) a number of contributions will be found dealing with these important questions, and at the same time with the modern view of the more theoretical considerations (contributions by A. Sticker, E. Engelhorn, P. Kroemer, Ph. Jung, P. Haendly, C. J. Gauss).

The second body in the thorium series which is of importance to the practitioner is thorium-x, which is isolated by a complicated process from radiothorium (mainly at the Auer Works in Berlin). Thorium-x is slightly soluble in water, forming a colourless solution. Its radioactivity, in contrast to that of mesothorium, is very transitory, as a glance at the preceding table will show. Next to it comes a gaseous substance, thorium emanation, which has only a very brief life, a fact which serves to distinguish it from radium emanation, the duration of the existence of which happens to be about equal to that of thorium-x. The brief life of thorium emanation naturally makes its use therapeutically in an isolated condition impossible; but, on the other hand, the rapidity of its transition produces for it great advantages over radium emanation. The latter can only become fixed in the body with difficulty, since the absorptive capacity of the blood and tissues is slight so far as this gas is concerned; the consequence being that the greater part of it is rapidly re-exhaled, and only a part of the total radiant energy which was taken into the body comes into action. With thorium emanation it is otherwise. The portion of life of thorium emanation is so brief, that only a very small fraction of it can be exhaled: by far the greater part goes into the system itself in the form of those substances which follow it, thorium A-D, substances which are physically solid, and exercise a powerful and enduring effect by virtue of the electrical explosions which arise during the transformation from one element to the next one. The excretion of the thorium elements takes place gradually (25 per cent of the mass injected is excreted within four days).

So far as its application to therapeutics is concerned, the radio-active energy of thorium-*x* proceeds from substances whose mass is too small to be weighed; for this reason the mass of thorium *x* to be employed is calculated in terms, not of weight but of energy content, and it is ordered, for example, as 50 to 100 electrostatic units of thorium-*x* for daily use (50,000 to 100,000 "maché units" in the older nomenclature). Solutions of thorium-*x* are prescribed sometimes for oral administration, at others for intravenous or intramuscular injection. A lively controversy has sprung up as to which is the best form of administration. Our own extensive observations show that there is a real advantage to be derived from injection of the thorium *x* in the neighbourhood of the tissues to be acted upon (e.g. in the vicinity of a diseased joint); the much more important general effects of the substance are in no way better secured by intravenous than by oral administration, but the dose needed to produce these by the oral method is somewhat higher.

The chemical effects of the thorium element are not different from those of radium, and it is indeed from a study of radium that most of our knowledge of the chemical effects of radio-active bodies has been gained. Its biological action also harmonizes closely with that of radium; yet a certain difference is observable in its intensity, owing to the variability of the content of alpha-, beta-, and gamma rays in radium and thorium preparations.

The principal of these biological effects may be briefly reviewed here:

1. The *soluble ferments* of the body (diastase, pepsin, trypsin, etc.) are said by some writers to be influenced by the alpha-rays of thorium preparations; some say they are inhibited, others that they are stimulated. What seems to be the fact, however, is this (W. Falta): that material which has been previously or simultaneously subjected to the chemical effect of the rays, is more readily and quickly acted on by ferments; larger doses of the rays prolong the process.

2. The *endocellular ferments* of the body, and particularly those that are autolytic, are always stimulated, never inhibited, by radiation.

3. *Lower plant growths* (bacteria, etc.) are inhibited, and even killed, by large doses of the rays (from mesothorium, or by introduction into solutions of thorium-*x*). So far, however, it has not proved possible to apply this fact to therapeutics.

4. The development of *plants* and of *animal ova* is stimulated by small doses, but definitely inhibited by large ones.

5. In the *local* action of radio-active substances, and particularly of mesothorium, on animal tissues, it is possible, speaking generally, to perceive a stimulation of growth (even in tumours) under the influence of small doses; large doses, after a certain latent period, induce necrotic changes, to which some tissues—that of neoplasms in particular—are especially liable.

6. The *general effects on the animal organism* (with special relation to thorium-*x*) are as follow :—

(*a*). *Stimulation of the respiratory metabolism* (increase of the caloric exchange). The rise in the minimal metabolism during rest may amount to 20 per cent and more. Flesch's statement that the respiratory quotient shows a definite increase lacks confirmation (Bernstein). Such a stimulation of oxidation could until now only be effected by administration of thyroid substance. Thorium-*x*, which may be given without anxiety in medium doses over a long period, is therefore a suitable adjuvant in the treatment of obesity. On the other hand, experience shows that the use of radio-active substances is absolutely contra-indicated wherever it produces an unwelcome rise in the energy exchange, e.g. in **Fever, Graves' Disease,** and **Diabetes Mellitus.** In the latter, radium and thorium-*x* produce a definite increase in the glycosuria.

(*b*). *Increase in the Protein Exchange.*—This effect is quite insignificant.

(*c*). *Purin Metabolism.*—A limited increase in the excretion of uric acid which is found under the influence of radium, takes place just as well with thorium-*x*. Its destructive influence on tissues rich in nuclei should be considered here. In the face of its very definite action on gouty processes; however (*vide infra*), the increase in the output of uric acid appears but small and transient. It is therefore reasonable to suppose that the action of thorium-*x* lies not merely in a mobilizing influence on the sources of uric acid in the body (the nuclear substance of the tissues and especially of the leucocytes) and on uric acid deposits (joints, tophi), but also in a promotion of the destruction of uric acid itself. Experiments in vitro (W. Falta) confirm this hypothesis.

(*d*). The *Red Corpuscles.*—Small doses of radium (e.g. a single injection of $\frac{1}{10}$ mgram radium bromide), also small and medium doses of thorium-*x* (e.g. 40 to 100 electrostatic units daily) lead to hyperglobulism, apparently by direct stimulation of blood production. Large doses have a precisely opposite influence, apparently by direct destruction of the red corpuscles. With corpuscles of normal resistance, this deleterious effect begins to be exercised at a daily dose, often repeated, of about 300 electrostatic units. If the resistance is subnormal, however, much smaller doses are dangerous to the red corpuscles; and under these circumstances a hæmorrhagic diathesis may be induced.

(*e*). *Leucocytes.*—Under very small doses (e.g. the usual small doses employed in oral and inhalatory administration of radium emanation) a hyperleucocytosis develops. Thorium-*x*, however, in doses above 50 electrostatic units daily, may lead to a definite diminution in all the white corpuscles of the blood. After a three weeks' course of about 100 units daily, the leucocytes in normal persons are nearly always reduced to 2000 or 3000 per c.mm.; with still larger doses they may disappear from the blood almost entirely. In animal experiments of this latter type there are extreme degeneration of the spleen pulp and atrophy of the lymphoid tissue; beside this, the chromaffin tissues degenerate, a change to which the sharp fall in blood-pressure which occurs is apparently due.

(*f*). *Coagulation of the Blood.*—The coagulability falls in direct proportion to the measure of the radio-active substances used, particularly with thorium-*x*. This tallies with the clinical observation, that in hæmorrhages of every kind the utmost foresight in the prescription of thorium-*x* is imperative.

(*g*). The *nervous system* is notably stimulated by small and moderate doses of thorium-*x*. For elderly persons, and those manifesting various kinds of **Nervous Exhaustion,** it is a valuable tonic. The daily amount must not exceed 40 to 50 electrostatic units. The explanation is not yet forthcoming. We ought, however, to remark that the highly radioactive baths of Gastein and Kreuznach have been proved by the experience of many decades to be powerfully stimulant to exhausted nerves. Not long ago Dr. Heiner, of Joachimsthal, wrote describing similar results.

(*h*). The *reproductive glands* are very sensitive to radio active substances. Their local action, like that of the Röntgen rays, may induce sterility. The usual small doses of radium emanation are indifferent. The somewhat larger content of radium-energy, which is usual at Joachimsthal, as well as oral application of 30 to 40 electrostatic units of thorium-*x*, increase **Potency** (Dr. Heiner's and our own personal observations). Really large doses have an opposite effect.

Therapeutic Application.—With these general biological observations the indications for therapeutic applications are in agreement. Here we can only give a brief review, in addition to some critical remarks based on our own very extensive observations.

Tumours of various types and sites, benign as well as malignant, can be treated effectively only by local application (radium or mesothorium). To secure results in rapidly-growing tumours of moderate size, at least 12,000 to 15,000 mgram-hours are necessary. Up till now the best results have been realized in **Uterine Cancer,** and many experienced gynæcologists now prefer radiation to total extirpation. The question is still undecided; a few more years are needed in order to reach definite conclusions about it.

Sterilization of Women.—In the treatment of **Uterine Myoma** and other diseases. In young women, the results for the most part seem to be temporary only; after one to three months ovulation occurs again, if the treatment has not been repeated. In older women, however, a single brief course of treatment, sometimes within a few days, gives a definite start to the menopause. This refers only to the local action of radium or mesothorium. Hitherto the gynæcologists prefer the Röntgen rays for these purposes.

Treatment of Obesity.—Allusion is made above to the adjuvant effect of thorium-X given internally. Specially, von Noorden speaks of its beneficial effect in connection with the Homburg cure, in respect both of weight reduction and of improvement in bodily freshness and capacity for work.

Chronic Rheumatic Affections of the Joints, Muscles, and Nerves.—Local applications (of small bags containing Joachimsthal pitchblende refuse, mud containing mesothorium, etc.) have to be considered, as well as baths and oral administration of radium emanations (Joachimsthal, Kreuznach, Münster-a-St., Gastein), and above all, oral administration of thorium-X (50 to 80 electrostatic units daily). Almost always this leads at first to perceptible increase in the symptoms (swelling and pain), but later, beneficial effects are seen. It is not yet known satisfactorily by what means the radio-active substances act upon the rheumatic process.

We have in the meantime only to acknowledge the facts. To be frank, it is not possible to reckon *a priori* with confidence on good results in rheumatic cases.

Gout.—The inhalations of weak radium emanations, originally recommended by His, have proved to be quite inadequate. The treatment with radium emanations, with the patient shut up in a tightly closed room, has been proved to be almost superfluous, since in thorium-X we have found a much more controllable and convenient radio-active substance. We give it to gouty subjects, sometimes intravenously, sometimes by mouth; we prefer the latter, as a rule. The daily dose varies between 50 and 100 electrostatic units, the duration of a course of treatment being from two to four weeks. During the treatment, careful observations of the number of leucocytes and of the excretion of uric acid must be kept. A sharp increase in the former at the outset of the treatment is to be desired; but after four or five days the total should return to an amount corresponding to the dietetic intake. Gouty persons, undergoing treatment with thorium-X, should always be in the hands of an expert. They seem to be more sensitive than other patients to the radiations. We see, moreover, that treatment with thorium-X carelessly superintended and lacking expert control may, in the gouty, lead to anæmia, leucopenia, and cardiac weakness. If carefully conducted, however, it does not involve the least risk, and it has an obvious effect on the attacks and on tophi. Treatment by oral administration can be carried out two or three times in a year.

Loss of Sexual Power.—(*Vide supra.*)

Anæmia.—The hopes entertained of the value of thorium-X in the treatment of pernicious anæmia have not been realized. It is true that the erythroplastic system (bone-marrow) can be, so to speak, whipped up by this means, and that under these conditions the number of red corpuscles rises quickly; but the gratification is short-lived;

and it appears to us—contrary to the enthusiastic and precipitate descriptions given by a number of other writers—that in this disease treatment with thorium-*x* has no future. Moreover, this is readily understood, since in pernicious anæmia one has always to deal with a hæmolytic type of anæmia: the point of attack of the morbid process lies in the corpuscles themselves; the bone-marrow is over-stimulated in response to them, and thorium-*x* merely adds another stimulus of brief duration thereto. On the other hand, our experience with anæmia due to deficient marrow activity is favourable, and especially in chlorosis; even in severe and unusually obstinate cases, which have proved resistant to iron and arsenic, we have seen splendid results.

Leukæmia.—Here we are scarcely concerned with radium; the results obtained by thorium-*x* are such as are achieved by the usual application of the *x*-rays. In essentials we are dealing with a similar therapeutic factor (similar rays). If good results are to be obtained, the dosage must exceed 100 electrostatic units per day. Such doses should, however, be given for two or three days only; then a pause should follow, during which the number of leucocytes and red blood-corpuscles should be carefully counted, and the resistance of the latter estimated. Further treatment is regulated by what is found. Careful observation and personal experience prove that for leukæmia, thorium-*x* is not merely as good as Röntgen therapy, but that it is moreover susceptible of much more accurate gradation. The danger of skin burns, which it is true can be prevented in modern *x*-ray treatment, are of course completely avoided. It is too soon to say that the prognosis of leukæmia is definitely improved by the introduction of the thorium treatment. At all events, the treatment of this disease with thorium-*x* promises more for the future than that of pernicious anæmia by the same means.

Thus far, treatment with preparations of the thorium group has by no means proved a panacea for the general practitioner's use, but remains still in the hands of those who have acquired special skill and experience in its employment. This is well. It is an unsafe form of energy to play with. One mgram of radium gives off in an hour ·118 calories, answering to the heat value of ·5 kilo of first class coal. With thorium-*x* the total energy is infinitely greater. The sum of a million electrostatic units, which could never be used practically, is contained within a mass of thorium-*x* considerably below the smallest measurable weight. Compared with the fatal dose of thorium-*x*, an equal weight of our strongest alkaloidal poison would appear as an innocent substance. It is electrical power with which we are working. In contradistinction to all other forms of electro-therapy, we possess in the radio-active substances means of carrying electrical energy into the depths of the body, and there subjecting the juices, protoplasm, and nuclei of the cells to an immediate bombardment by explosions of electrical atoms. We may, therefore, designate this internal treatment with radio-active substances *internal electrotherapy*.

TUBERCULIN THERAPY.

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Tuberculin has, during the past year, continued to excite great interest and much discussion in all gatherings of students of pulmonary tuberculosis. This has been particularly so in Great Britain, where many of the most important contributions were made public.[1]

Theory of Action.—The explanation of the action of tuberculin still rests upon hypothetical grounds. Tuberculin is not a toxin, and forms no antitoxin. It was formerly held to excite, when injected into healthy animals, neither sensitiveness (anaphylaxis) nor the formation of antibodies. It has been clearly shown, however, that when the second dose has been injected into the blood-stream or into the cranium of a sensitized animal,[2] anaphylactic symptoms do supervene, though often larger quantities are required than in serum anaphylaxis. Experimental passive anaphylaxis[3] occurs regularly, and hypersensitiveness can be transmitted from mother to offspring, which does not take place through the milk.[4]

It has been held by most workers that tuberculin treatment is a process of active immunization. The tuberculous infection stimulates the formation of lytic substances, which in turn attack the tuberculous poison in the cells or circulating in the body, and by a process of parenteral digestion split it up.[5] The therapeutic injections of tuberculin increase these lysins. They may set free certain antigens (partial) which in turn call into existence more lytic substances.

Béraneck[6] and Sahli,[7] on the other hand, hold that tuberculin treatment is not a process of active immunization, but rather an immunizatory healing action. Two processes are concerned in recovery from tuberculosis—one lytic, the other sclerogenic and absorptive. The former is connected with the "protecting cells" (phagocytes, hepatic cells, etc.), and the latter with the "reparative cells" (connective-tissue cells). Tuberculin stimulates or educates these cellular activities (properties). Now the value of any specific treatment depends upon (1) the stimulating or reaction-producing power of the treatment used, and (2) upon the capability of the cells to respond to the stimulation by the formation of lytic substances, capabilities which may vary with the condition of the patient and during the course of the disease, and with the tuberculin. Reactive processes occur in all tuberculin treatment (even when reactions are apparently absent).

and consist in the stimulation of the formative inflammatory antibodies and the specific tuberculin amboceptor. This amboceptor splits tuberculin into harmful (fever-producing) and later into harmless products (antithermic effect). Tuberculin treatment is not an active immunization (which never occurs in tuberculosis), but only a curative treatment, and the rules of active immunization do not hold. The aim should be to determine the optimum dose, not to reach large doses, which may be dangerous. Repetition of the optimum dose encourages "disintoxication" of the patient. Fever is not a contraindication, and intrafocal injections in surgical tuberculosis are to be recommended. Exception may be taken to some of these statements, but their work is full of suggestions.

Excellent papers along these lines were contributed by Sims Woodhead[8] and by E. R. Baldwin.[9]

Many attempts to produce an active immunization in animals to tubercle bacilli by the use of tuberculin have failed; in fact, such sensitized animals, Krause[3] and Austrian[10] found, might or might not succumb more rapidly than normal controls to an injection with virulent tubercle bacilli.

In an interesting article, Allen[11] attempts to analyze the failure of tuberculin to produce better results. He states what has long been known, that no antibodies so far discovered seem to have any importance in the production of immunity against the tubercle bacillus. A thoroughly efficient vaccine should be prepared from autogenous, fully virulent, freshly isolated cultures that have been subjected to as little heat or antiseptics as possible, or it should be polyvalent. He warns against its use in unsuitable cases, or by untrained men.

In an editorial in the *Journal of the American Medical Association*[12] the historical side of the use of living tubercle bacilli in immunization was discussed, and it was shown that as early as 1891 Trudeau had used slightly virulent cultures for this purpose with partial success. It has long been known that in healthy cattle, only living tubercle bacilli can bring about any degree of immunity. The effect of such a vaccine upon tuberculous animals seems to hold the primary lesion in check for a time, and when this ceases to be active, the seat of the secondary infections may show signs of disease. S. A. Petroff, F. H. Heise, and Lawrason Brown[13] attempted to immunize guinea-pigs by the method of Barber and Webb (injecting at weekly intervals approximately 1, 2, 3, 5, 10, etc., tubercle bacilli up to 1000). The treated animals outlived the controls, but eventually some died from tuberculosis, and all became tuberculous.

The success of vaccination against small-pox suggested the idea that a non-virulent tubercle bacillus might produce some immunizing or curative effects. Accordingly, when F. F. Friedmann[14] announced that he had obtained astonishing results by the injection of a living "cold-blooded" tubercle bacillus (turtle), the possibility that he had acquired a potent vaccine occurred to many, although A. Moeller[15] had previously tried and abandoned such treatment. After a brief, but well conducted, advertising campaign in the American newspapers Friedmann came to New York. Every opportunity was given him to prove his claims, but his inconsistencies and his lack of scientific spirit quickly turned from him many who were at first inclined to believe him. The results obtained in bone and joint cases were in some instances striking, but in many no improvement was noted. The immediate results among the patients with pulmonary tuberculosis were not so favourable as among the "control" cases (Barnes).[12] At first, the treatment was looked upon as harmless, but owing to the violent reactions that may occur, it is quite possible that the death of the patient may be hastened. Mannheimer,[13] who is rather favourable to the Friedmann treatment, could see no benefit in his eighteen patients. A Canadian commission came to the same conclusion, and while no published statement has come to the authors' attention, they understand that in two New York hospitals the treated patients did no better than the untreated. The United States Government was unable to satisfy itself that Friedmann's claims had been substantiated.[14] Friedmann is said to have carried at least £20,000 back to Germany, and many look upon the whole thing as a gigantic fraud perpetrated by a money-grabbing news syndicate. The Friedmann Institute in New York City was closed by the Board of Health.

M. Rabinowitsch,[15] who speaks in an offhand manner of his ability to obtain cultures of tubercle bacilli from the patients' blood, claims to have destroyed at will the virulence of tubercle bacilli, and with them to have immunized guinea-pigs against virulent tubercle bacilli. This work lacks verification.

In 1903 Piorkowski[16] prepared pure cultures for Friedmann from two turtles which had become spontaneously tuberculous. Of a large number of turtles which he inoculated with this "tubercle bacillus," only two became affected in a similar manner. Piorkowski now uses two preparations: one a suspension of living turtle tubercle bacilli, and the other an old tuberculin made from its cultures. He gives three doses of the suspension intravenously, and then 100, 300, and 1000 mgrams of the tuberculin, at rather long intervals. He has had no abscesses develop, and the symptoms soon abate. He mentions Meyer, Gumbiller, Klemperer, and Karfunkel of Berlin, as using the preparation.

A few still use Marmorek's serum and report a certain percentage of favourable results. No scientific evidence exists for such treatment.[17]

Tuberculin in Diagnosis.—It is of considerable interest to note that tuberculin is being used less and less for diagnosis. The ophthalmic reaction is occasionally dangerous. The cutaneous reaction in adults is of little or no value when positive. The Ellermann-Erlandsen modification of the cutaneous test has not been sufficiently controlled, but is apparently little used.[18] Many observers who warmly advocate tuberculin therapeutically, just as warmly oppose it in the form of the subcutaneous test, which they declare is dangerous. Sahli[19] states that it should never be used, while Camac Wilkinson[20] urges its use whenever tubercle bacilli are not present in the sputum. Gelien and Hamman[24] conclude from a study of the subsequent history of 1000 patients who received the tuberculin tests, that they are of value only in reference to the condition of the patients at the time they are given ; that a reaction to a conjunctival test with a 1 per cent solution of tuberculin, in the absence of other clinical evidence, cannot be used as evidence of the presence of tuberculous disease. As regards prognosis, more of those (in the various stages) who reacted to a 1 per cent conjunctival test have died than of those who did not react ; while in patients dying of tuberculosis, the length of life following the administration of the tuberculin tests is approximately the same in those who react as in those who do not.

It is impossible in many cases to diagnose or to exclude secondary infections in pulmonary tuberculosis. Many have used secondary vaccines, and, like Rundle,[25] obtained an occasional excellent result. Hudson,[26] however, obtained good results in 20 to 30 per cent only of 400 cases at Davos. Radcliffe,[27] in the Parkes Weber prize essay for 1912, states that in the majority of cases of advanced pulmonary tuberculosis, the tubercle bacillus is the sole infecting agent, that vaccines made from the organisms obtained in some cases by careful washing may prove of some value, and that serum therapy against secondary infection is not likely to be of service.

New Tuberculin.—The search for an improved tuberculin still continues. "Tebesapin" (W. Zeuner) has changed its name to "molliment." Moeller and Wolff[28] used this heated emulsion (70 to 72° C. for one hour) of tubercle bacilli already subjected for seven days to the action of sodium oleate, on animals, but were unable to find it any better than other tuberculins.

Lyons[29] has precipitated O.T. with absolute alcohol, and calls it T.F. It is only a weak tuberculin.

Dixon's tuberculin (a physiological salt solution of soluble matter in tubercle bacilli which might have been extracted with ether and ground up) was used by Francine and Hartz[30] with good results.

Tubolytin (Siebert and Roemer)[31] is a watery extract of tubercle bacilli, which keeps well and is free from extraneous substances. It differs apparently little from v. Ruck's watery extract, and is much weaker than O.T.

Tuberculin Rosenbach (O.T. weakened by the growth upon it of *Trichophyton holosericum album*) has found advocates in Drowatsky and E. Rosenberg.[32] Elsaesser[33] reports good results when injected near skin and laryngeal lesions ; and after trying intrabronchial injections, now obtains good results by intrapulmonic injections of 0·1 to 1·0 c.c. Fortunately the tuberculin is weak. Lesser and Koegal,[34] in a lengthy study, concluded from their work on animals that it was a weak tuberculin ; from their work on men, that it could be used in diagnosis (1000 mgrams final dose), could cause some unpleasant symptoms, and might be used in treatment without danger if the dosage is small enough.

Stimulated apparently by the work of Friedmann v. Ruck[35] has reviewed the literature on the relative value of living and dead tubercle bacilli and of their endotoxins in solution in active immunization against tuberculosis. Many will recall his watery extract and his claim that it was similar to v. Behring's tulase. V. Ruck's new extraction differs but little from his former, but now he states that all the specific antibodies are present in the blood-serum of every case after a "single full dose," that under proper conditions of complement and antigens a "maximum bacteriolytic" power is manifested, that the immunized animals resist, while the controls always succumb to, a virulent infection, and that in over 150 patients a "single full dose" was invariably followed by what may be termed a "clinical cure." Julian,[36] who has worked with v. Ruck, obtains similar clinical results. Cummings,[37] who attempted to repeat v. Ruck's experiments, may have used too large doses of virulent tubercle bacilli; but in any case he obtained no evidence of immunity, as his treated guinea-pigs all died about as quickly as the controls. This work should be fully confirmed before being accepted, and animal experimentation should precede the treatment of patients.

Podushka[38] reports good results following the use of Weleminsky's[39] "tuberculomucin." This is a tuberculin made from a growth of tubercle bacilli so changed that its metabolic activity gives rise to a coagulable protein and mucin. Koch[40] has obtained good results with "sanokatzin tuberculin," which contains 0·01 gram calciumglycerolactophosphate and 0·005 gram tuberculin in 1 c.c. of physiological salt solution. Romanelli[41] reports favourably on the immunizing properties of tuberculous sputum dried by heating. Frölich[42] believes "tuberculosan-Burow" to be of value in bovine tuberculosis. Kirchenstein[43] has published a long article on the studies she has made in Spengler's laboratory on the lytic value of "I.K." Meyer and Schmitz[44] believe that tuberculin unites with some part of the erythrocyte, and by it is carried into the focus.

Several years ago Vaughan[45] suggested that the tubercle bacillus could be split up into two parts, a poisonous substance and a sensitizing residue. B. White,[46] who has carried on some of this work, states that it seems possible that the sensitizing property of the residue may be due to the presence of a small amount of whole protein.

The Variety of Tuberculin to be Used.—Each form of tuberculin has its advocates. Some dwell much upon the "exotoxin" and "endotoxin," but no one has so far shown that an "exotoxin" exists. O.T. contains many substances beside tuberculin, and for this reason many advocate albumose-free (A.F.) tuberculin. Brown[47] was the first to combine an extract of the tubercle bacillus with the pulverized germ under the name of B.E. (?). Others have also used similar combinations (Wolff-Eisner). Sutherland[48] uses a polyvalent tuberculin consisting of O.T. (human) 0·025 c.c., O.T. (bovine) 0·025 c.c., human vacuum tuberculin 0·025 c.c., bovine vacuum tuberculin 0·025 c.c., human T.R. 0·25 c.c., bovine T.R. 0·25 c.c., human B.E. 0·25 c.c., bovine B.E. ·033 c.c., polyvalent bouillon emulsion ·034 c.c., P.T.O. ·35 c.c. and T.O.A. ·35 c.c.

Dosage.—There is no conformity in the dosage of tuberculin. The majority are inclined to favour a very small first dose and a carefully regulated increase. Little use has been made of the opsonic index to regulate the dose, though Colebrook[49] writes of it very favourably. The use of the maximum non-reacting dose (method of White) has been used by Cashman[50] in surgical tuberculosis with good results. White's[51] method consists in determining the tuberculin-sensitiveness of the patient by a modified cutaneous test, which does not allow for any variation in the absorptive power of different skins. Brown[52] suggests the use of the intradermic test to determine the sensitiveness in regard to the first dose. Sahli's[7] and Brown's[17] scale of increase may be found in their writings, while Barcroft[53] has simplified Wilkinson's schema. Sahli[7] seeks the optimum dose, which may be small, and repeats it. So far as we can tell to-day, it seems wisest to repeat any dose until it ceases to benefit the patient, and then to increase slowly to large doses, which experience has shown are usually necessary to form antibodies in sufficient quantities to be demonstrable. White[54] pleads for a standardization of tuberculin, so that dosage can be more exact; but granting that such can be established, of what value would it be when the susceptibility of different patients varies as one to ten thousand?

It is now generally accepted that the subcutaneous method is alone accurate. Mackenzie[55] states that he has given 4000 mgrams of O.T. by mouth to a tuberculous patient without reaction. With T.R. this is not so, but a much larger dose is required. B. Moeller showed some time ago that oral administration was very uncertain. Woodhead[8] states that a pint of O.T. given orally produces no effect. Petruschky[56] urges the rubbing in of his "tuberculin mitigatum" in the form of a liniment.

A. Michailowskaja[57] uses twenty solutions of tuberculin, the weakest containing in 1 c.c. ·000,000,000,000,001 gram. He injects twice a week, and once a week tests the cutaneous reaction. If at the end of twenty-four hours the papule is as large as the previous weaker injection produced, the dose is repeated; if smaller, the dose is increased. He claims good results.

By the daily injection of $\frac{1}{100}$ to $\frac{1}{30}$ gr. of strychnine hydrochloride subcutaneously for four or five days before giving tuberculin, Whelan[58] found that no bad results followed, and large doses could be more easily arrived at. This is of interest on account of the fact that tuberculin is said to lower the blood-pressure, and strychnine may counteract that tendency. Raw[59] states that all pent-up pus should be freed before tuberculin is given, as otherwise general tuberculous infection might occur. He still believes that bovine tuberculin should be used for patients infected with the human tubercle bacillus and human tuberculin for bovine infection. Honl[60] combines nuclein with tuberculin, because it increases the number of leucocytes temporarily.

The use of tuberculin in febrile patients has apparently given some excellent results. Very small doses of B.E. or S.B.E. are most widely used. Samson[61] believes it can reduce fever, with or without producing any discoverable change in the focus.

Dangers of Tuberculin.—Fowler[62] believes that tuberculin is always dangerous, and specially so when fever is present or tuberculin reactions occur. It will be recalled that Virchow early attacked tuberculin, and said it caused a "scattering" of the tubercle bacilli, which statement he modified later. More recently, L. Rabinowitsch[63] reports finding tubercle bacilli in the blood of tuberculous animals after the tuberculin test, when previous examination had been negative. Bacmeister[64] examined the blood of fifteen patients during the height of the tuberculin reaction, and obtained positive results by animal inoculation in four.

Tuberculin Dispensaries.—The most remarkable thing in connection with tuberculin treatment during the last few years has been the striking growth of the "tuberculin dispensary," so strongly urged by Wilkinson.[23] "In less than two years more than forty centres have been established." In his article on the rôle of tuberculin dispensaries, Wilkinson includes a polemic against Sir William Osler, and says later: "I am just now completing observations extending over three years, and I do not hesitate to say that, although we have been working under most exacting conditions, strictly confining ourselves to the use of tuberculin without having recourse to drugs or improved diet, or improvement in the life surroundings of the individual, I think we can produce evidence which demonstrates pretty clearly that relapses are less frequent and slower to appear than in cases treated by the simple sanatorium methods." He states further that this experiment in London, covering a period of three years and open to investigation by all, now approaches its termination, and concludes that to all unbiassed observers it will prove the main points upon which he has advocated this treatment. Parsons[65] writes enthusiastically of this method, and Bennett[66] less so.

Results.—The results of tuberculin treatment have been analyzed by Bardswell[67] and Shaw.[68] The former concludes that from a clinical point of view tuberculin was a negligible factor, and in no wise influenced either the immediate or the ultimate prospect of the patients to whom it was given. Three months later he stated that patients who took tuberculin were more likely to lose their bacilli (a long known fact). Riesmann[69] noted the same result. At the suggestion of Batty Shaw, Ripps[70] treated ten cases, but too frequent and probably too large doses of tuberculin render the experiment of little value. Some months later Watkins,[71] also working with Shaw, treated eleven patients, three febrile, six intermittently febrile, and two afebrile, with tuberculin, without apparent benefit. Shaw[72] has critically reviewed the results of tuberculin treatment, and has come to the conclusion that they were not controlled and are therefore of little value. Mackenzie,[73] who gives no figures, believes that selection of cases may account for the good results, which are not "brilliant, certainly not convincing."

Elderton and Perry,[72] in a study of the patients treated with and without tuberculin at the Adirondack Cottage Sanatorium, and the Ayrshire and Bridge of Weir Sanatoriums, state that there is no evidence from the mortality shown in the data to prove that tuberculin as compared with ordinary sanatorium treatment, appreciably lengthens the life of the consumptive.

Effect of Tuberculin on the Blood.—Miller, Lupton, and Brown[73] find that tuberculin in any dose may markedly increase the number of leucocytes. A slight leukopenia may occur shortly after injection. Following a positive tuberculin test, there was always an essential increase in the number of leucocytes. No appreciable change in blood-pressure was noted in tuberculin-treated cases, even after the largest doses (800 to 1000 mgrams). From a study of Arneth's neutrophilic blood picture in fifty cases, they conclude that the nuclear picture is of no value in determining the dose of tuberculin for therapeutic purposes, and that, following the subcutaneous tuberculin test, the picture is not changed until the stage of reaction occurs, when there may be a slight shifting to the left. Durel,[74] however, believes the Arneth index of value as a guide in tuberculin dosage. Black[75] finds an increased leucocytosis following tuberculin treatment, and that the polymorphonuclears show an increased power of phagocytosis to the tubercle bacillus; also that Arneth's picture shifts to the right after tuberculin treatment, which is at variance with the observations of Miller, Lupton, Brown,[73] and M. Solis Cohen and Strickler.[76] Duke[77] finds a great increase in the platelet count in animals following the injection of tuberculin.

Among the notable contributions to the tuberculin literature during the year are fifteen theses by Sahli.[7] Some of his beliefs are as follows: All tuberculins are essentially identical. There is no proof of the existence of a tubercle exotoxin. The best tuberculins are those freest from adventitious albumins. The degree of the dilution is of importance. Diagnostic injections (subcutaneous) and obvious clinical reactions, are dangerous. Tuberculin treatment is chiefly valuable in incipient cases, though it may produce a symptomatic effect in advanced cases. The family physician should know how to administer tuberculin. One should not seek the point of tolerance, but the optimum dose. As a rule, acute cases cannot be treated. Well-diluted tuberculin treatment constitutes a real and great therapeutic progress.

B. Moeller,[78] in a conservative review of the subject of tuberculin, sums up as follows: A combination of sanatorium and tuberculin treatment is the best; it can be used in early and carefully selected ambulant cases; tuberculin treatment of to-day is characterized by very small doses, gradually increased without reaction to larger doses; the final result depends less upon the form of tuberculin than upon its method of administration; the treatment must be individualized, and not given by rule of thumb; it should be given subcutaneously and in repeated courses, not only by sanatorium physicians but by private practitioners.

During the past year new editions of two of the best books on tuberculin have appeared "Tuberculin Treatment," by Riviere and Morland and "Tuberculin Treatment," by Sahli. The former is the best book for a beginner, and the latter is full of suggestion for the more advanced observer. "Tuberculin in Diagnosis and Treatment," by Hamman and Wolman, is an excellent handbook, and covers the literature completely.

SUMMARY.—During the past year little advance has been made in the scientific use of tuberculin. It still rests upon an empirical basis. As a rule, only its advocates write about it. What has always puzzled the authors is the fact that, use tuberculin how they will, they can never bring about such happy results as many of its ardent supporters claim. It seems that so far no statistical proof has been adduced to show that tuberculin is much superior to other forms of treatment in many patients but in a few the results are so striking that those who obtain them are over-enthusiastic.

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Part II.—The Dictionary of Treatment.

A REVIEW OF MEDICAL AND SURGICAL PROGRESS FOR 1913 BY MANY CONTRIBUTORS.

Together with a brief Synopsis of Treatment recommended during recent years

GENERAL REVIEW.

Abdominal Surgery.—The past year has witnessed the widespread adoption of Crile's method of "Anoci-association" technique in abdominal surgery (described in other sections of the Annual), a principle that demands of the surgeon an infinite care and attention to detail. When correctly performed, the technique appears to be a distinct surgical advance, though its true utility cannot be rightly judged until it has emerged from the glamour of its originator's sincere enthusiasm.

The distressing but vague disorders associated with constipation continue to receive a large share of attention, but surgical opinion is by no means unanimous as to the most desirable method of treating these complaints. It is unfortunate that experimental study cannot be of much value in this instance.

The subtle conceptions of pancreatic disease formulated by Deaver shed an important light on this difficult subject.—[B. G. A. M., and H. C.]

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Anæsthetics.—The attention of anæsthetists, so far as new methods are concerned, is chiefly directed at present towards two processes, viz., intratracheal insufflation of ether, and the combined use of general and local anæsthetics and preliminary alkaloids in accordance with the principles laid down by Crile under the name of anoci-association. Both these innovations are likely to find a place, and a considerable place, in the usual practice of anæsthetics in the future. At present they are in that stage when, owing to their novelty, they are being widely employed without that selection of cases which fuller knowledge is pretty sure to bring. As routine measures in all cases they are obviously open to many objections. It is equally certain that in their own proper fields each of them offers advantages that are not to to be obtained by any other of the methods in common use. Thus, one regards intratracheal insufflation as the method *par excellence* for intrathoracic surgery and for many operations involving the mouth and nose, whilst Crile's method seems unrivalled for dealing with patients in a very feeble state and for operations for the cure of exophthalmic goitre.

Much work has been published during the past year upon various modifications of local and regional analgesia, and the spinal method holds its place as a most valuable resource in certain cases. Intravenous anæsthesia, after a fuller trial, seems unlikely to compete successfully with older methods and with those already mentioned.

The physiological work directly connected with anæsthetics that has to be noticed this year is not very abundant, but mention must be made of Levy's most suggestive contribution to the elucidation of the causation of death during chloroform anæsthesia.—[J. B.]

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CHILDREN'S DISEASES.—The methods of artificial feeding of infants in vogue in different countries are still very dissimilar. The amount of fermentation in the intestine which various forms of modified milk are capable of producing is obtaining considerable attention. The Berlin School of Finkelstein and Meyer (who emphasize the importance of fermentation as a cause of gastro-intestinal derangements in infants) is attracting many adherents, and *Eiweiss milch*, which they advocate, is being extensively used on the Continent and in America. Much of the literature on this subject in the past year has been connected with the value of *maltose* and its supposed advantages over lactose.

Whilst it is commonly acknowledged that overfeeding is more usual, a form of diarrhœa and sickness due to underfeeding is being more generally recognized. Little that is new has been added to the treatment of summer diarrhœa, but hypertonic saline solutions have received a more extended trial. Investigations tend to show that Quinton's marine plasma has no definite superiority over artificial saline of the same strength, and that saline injections are valuable in proportion as the loss of fluid exceeds the intake.

More stress is being laid upon the preventive treatment of rheumatism and its early recognition. Evidence of the frequency of infection by the nose and throat has accumulated. Enucleation of the tonsils and antiseptic treatment of the mouth, pharynx, and nose, now take a definite place in the management of rheumatic children.

More statistics are available indicating the very high incidence of tuberculosis in children as shown by tuberculin tests. That of von Pirquet is chiefly relied upon, but it appears that it should be employed more than once in a given case, and that the cases of proved tuberculosis in which it fails to give a positive reaction are not a few. Investigations in Edinburgh by Mitchell and Fraser lead them to believe that tuberculous infection of glands and joints in that city is chiefly bovine in origin. If this receives corroboration for other areas, our conception of the importance of bovine infection will be greatly altered. There is still no agreement as to the value of tuberculin in the treatment of the disease in children.

Infection of the urinary tract in children by the *Bacillus coli communis* is a condition which has recently come to occupy a prominent position. It is still most successfully treated by the plentiful administration of fluids and alkalies, though some success is claimed for urinary antiseptics and vaccines.

In the treatment of whooping-cough, a vaccine prepared from cultures of the organism described by Bordet and Gengou has been employed by several observers, who report favourably on its use.

A new eruption, styled "eczema oris syphilitica," has been described in congenital syphilis. The Wassermann reaction is furnishing evidence that syphilis and amentia are more closely connected than was formerly thought. Salvarsan as a remedial measure in congenital syphilis is still on its trial.

The occurrence of epidemics of so-called catarrhal jaundice has led to the suggestion that jaundice in children is due to an infection, and not, as formerly held, to digestive disturbances.—[F. L.]

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DERMATOLOGY.—The chief dermatological event of this year has been the session in London of the International Medical Congress with its important dermatological section. Vaccine therapy in skin diseases, which was one of the subjects of debate, has been stimulated and regulated by the work of many observers in all countries. The subject of alopecia was very fully discussed, and a consensus of opinion expressed that alopecia areata is not a contagious affection. Much attention was paid to the prophylaxis and treatment of syphilis, and largely as a result of these discussions a Royal Commission on Venereal Disease has been appointed.

A promising advance in treatment of tuberculosis of the skin has been achieved by experimental work on the model of Ehrlich's investigation on the chemotherapy of syphilis. Injections of cyanide of gold and potassium have been used with success in active and extensive cases of lupus vulgaris, and in combination with tuberculin seem to offer a real advance in treatment. The subject is fully discussed in the following pages.—[E. G. L.]

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DIGESTIVE DISEASES.—The awakening of new interest in old problems by the application of modern methods, which aim at discovering the perverted physiology of disease, is evidenced by the year's articles on constipation, visceroptosis, and chronic appendicitis, the principal of which are abstracted under those headings. Among diseases of the stomach, ulcer and cancer have received special attention; and some important investigations into rectal feeding are briefly recorded.—[ED.]

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General Medicine.—Subjects which are discussed at length in their appropriate paragraphs are rheumatoid arthritis, fibrositis, pernicious anæmia, and leukæmia. The value of benzol in the treatment of the last-named disease is considered fully. The interest awakened by recent research into the functions and diseases of the ductless glands is evidenced by the paragraphs on the pineal and pituitary bodies, as well as by those on endemic goitre and acute thyroiditis. Investigations into the etiology and general course of various infective diseases, such as rabies, actinomycosis, blastomycosis, and so on, are also briefly recorded.—[Ed.]

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General Surgery.—The progressive spirit of surgery shows itself in two directions: attempts at betterment of treatment hitherto accepted as good enough, and attack upon organs and diseases till now looked upon as out of reach. Instances of the former are to be found in the paragraphs on fractures and post-operative complications; of the latter, in those describing surgical treatment of cardiac, pulmonary, and arterial diseases.—[Ed.]

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Gynæcology and Obstetrics.—The two subjects which receive fullest consideration in this volume are the treatment of uterine cancer and the serum diagnosis of pregnancy; the latter appears to offer too many technical difficulties and opportunities for error to be of general applicability, though from the theoretical point of view it is full of interest. In regard to the former, it is clear that the gradual perfecting of operative technique and the introduction of radio-active methods of treatment have already begun to make inroads upon the hopelessness of this disease.—[Ed.]

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Diseases of the Heart and Blood-vessels.—No province of medicine has gained, or stands to gain, more notably from the application of scientific methods to clinical problems than that of cardiovascular disease. Its etiology is becoming clearer, as the accounts given in this volume of cardiac syphilis and of ulcerative endocarditis bear witness. Additions to our knowledge of the physiological perversions involved in cardiac failure are accumulating rapidly, thanks largely to British work; examples of these data are described under the headings "Auricular Fibrillation," "Auricular Flutter," and "Heart Block." Armed with this surer knowledge, the practitioner is on safer ground than heretofore when he is confronted by prognostic problems. Finally, treatment is becoming rationalized: the present volume gives new information as to the uses and limitations of digitalis, sodium salicylate, and other important medicaments.—[C. C.]

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ACUTE INFECTIOUS DISEASES.—The most important fact of the past year is Behring's announcement of a new prophylactic against diphtheria. This is a toxin-antitoxin mixture of a certain constitution, which has the effect of producing very large amounts of antitoxin when injected into the human subject (active immunization). Persons who have had diphtheria previously are especially susceptible to the action of this mixture. The serum from a case thus actively immunized has been used for passive immunization of another person. But this last method of immunization is not one to be recommended. Whether Behring's new method will fulfil expectations, remains to be seen. At the present time the only method of immunization against diphtheria is by the injection of antitoxic serum (passive immunization); and its effects are known to be merely temporary. Will those of the new method be more lasting?

The reader's attention is directed to Park's experiments on the dosage of diphtheria antitoxin. They point to the conclusion that one moderate or large dose given, when the patient is first seen, is more efficacious than repeated small doses.

It has now been found that the so-called "inclusion bodies" are not confined to scarlet fever, as was at first stated. It can now be taken as established that scarlet fever can be communicated to the anthropoid apes. But the cause of the disease still baffles investigation.

The records of the use of antityphoid vaccination in the United States, and especially those of the army, confirm amply the favourable results which have been observed in the English Army in India.

In the article on typhoid fever will be found an account of further experiences in the dieting of patients suffering from that disease, and especially of those who dislike milk. Views on this subject have altered very much during the past few years.—[E. W. G.]

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NERVOUS DISEASES.—The most important new fact in neurology within the past year has been the discovery, by Noguchi, of the syphilitic spirochæte in the cerebral cortex of general paralytics. This breaks the barrier between syphilitic and para-syphilitic affections of the nervous system. The treatment of general paralysis and of tabes continues to occupy various workers, and fresh methods are discussed. The study of epidemic poliomyelitis has also been advanced by Flexner and Noguchi's discovery of a globoid organism which apparently is the cause of the disease. Salvarsan and its methods of employment in cerebrospinal syphilis, together with the curious nerve-relapses which in non-nervous syphilis occasionally follow salvarsan administration, are also referred to. Amongst other articles will be found those on caisson disease, tetanus, epilepsy, ischæmic myositis, etc., together with a discussion on the legitimate uses of suggestion in therapeutics.—[P. S.].

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Diseases of Throat and Nose.—The diagnosis and treatment of diseases of the œsophagus and air passages are the subjects which perhaps have created most interest among specialists; and cancer of the œsophagus, even of its thoracic portion, can no longer be said to be wholly out of reach of the surgeon. In suspension laryngoscopy we owe to Killian an invaluable new method of directly inspecting the larynx.

The relative merits of tonsillectomy and tonsillotomy still give rise to much discussion, with a strong bias in favour of the former; but the various operations for carrying out tonsillectomy are still legion.—[W. G. P.]

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Ophthalmology.—A few years ago the weight of ophthalmic opinion as to the best operation for chronic glaucoma was decidedly in favour of iridectomy. At present it may be said to have declared in favour of sclero-corneal trephining. This is largely due to the improvement in the technique of the operation, and especially to the splitting of the periphery of the cornea which we owe to Colonel Elliot, of Madras.

The frequent dependence of certain ocular diseases, and especially of inflammations involving the uveal tract, on general toxæmia, has been much emphasized in recent discussions. By far the commonest source of toxæmia in these cases, it seems, is a diseased condition of the teeth generally pyorrhœa alveolaris. More on this subject will be found in the article dealing with diseases of the iris, ciliary body, and choroid.—[A. H. T.]

Important investigations by Dr. Burdon Cooper in respect to the pathology of cataract are fully described and illustrated by the author.—Ed.

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Renal Diseases and Diabetes.—Much attention has been devoted during the year to the estimation of the renal functions by the phenol sulphonaphthalein and other methods, and the bearing of the results on diagnosis and prognosis. High arterial tension in nephritis is fully discussed. Excellent results are quoted from the use of periods of protein-free diet in nephritis. Proteinuria has received considerable attention, and reproductions will be found of photographs of a remarkable case of multiple myelomata. Important work has been done in urinary antiseptics. Diabetes insipidus is considered in articles which throw light on its pathology and its relation to the pituitary gland. Diabetes mellitus formed the subject of a discussion at the International Congress in London and a number of articles have appeared in the journals. Though no great advance in pathology or treatment can be claimed, still our knowledge slowly progresses towards a better understanding of an absorbing and important disease picture.—[F. D. B.]

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Tropical Diseases.—The most noteworthy event is the discovery that pellagra is widely prevalent in Great Britain, while much valuable research has been done on this disease in the United States; it has therefore been made the subject of a special article. Sir David Bruce and his fellow-workers have established the identity of *Trypanosoma brucei* of nagana in cattle with *T. rhodesiense* of the recently discovered second variety of human sleeping-sickness, which will necessitate the destruction of the infected wild game in portions of Africa. The great value of the emetine treatment of dysentery has been established by extensive experience in many parts of the world, and a new specific drug is thus added to the very small number previously known; although more prolonged treatment may be necessary in some cases to prevent relapses than was at first hoped might be the case. The value of the hypertonic saline treatment of cholera has been confirmed by further experience in India and in China. A new species of hookworm affecting man has been found in India, which is also commonly met with in certain domestic animals; this complicates the prophylaxis of that disease. Important experimental work, throwing much light on the etiology of plague pneumonia, has been recorded by Strong and his colleagues in the Philippine Islands.—[L. R.]

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Urinary Surgery—The literature of the year contains no new departure in diagnosis or treatment, but methods already recognized are being tested. The skiagraphic demonstration of vesical tumours and their removal by transperitoneal operation or by high-frequency treatment, and stone as seen in Egypt, and its treatment by litholapaxy and by open operation, are discussed. Some attention has been paid to the surgery of single, horseshoe, and dystopic kidneys. Moore and Corbett have continued their valuable investigations into the damage to the kidney caused by operation and method of suturing.

Suprapubic prostatectomy, which has in this country superseded the perineal operation for simple enlargement, is the subject of articles by American surgeons who advocate the method. Wilms' method of perineal prostatectomy by lateral incision is also described. Young describes a "punch" operation which may prove useful for "small prostatic bars and contracture of the prostatic orifice."

The rôle of the prostate and seminal vesicles as primary foci of infection in chronic toxæmias and remote infections is discussed. Variations in operative procedure in hypospadias and in urethral defects after operation are described.—[J. W. T. W.]

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Venereal Diseases.—In the domain of syphilology much work has been done, both in pathology and treatment. Perhaps the most noteworthy fact is the discovery by Noguchi and Levaditi of the *Spirochæta pallida* in the brain and spinal cord in cases of general paralysis and tabes, a discovery which may modify our conception of these diseases. Noguchi has also given further demonstration of the culture of the *S. pallida* and other spirochætes. Further observations have been made on the life history of the parasite of syphilis by E. H. Ross, McDonagh and others, tending to show that the spirochæte form is only one phase in its life cycle, and that it goes through a resting or spore stage, which would explain the long latent periods in syphilis, and other points hitherto obscure. It is necessary to mention, however, that a similar life cycle was described by Maclennan in 1909.

As regards treatment, salvarsan is still extensively used, generally in conjunction with mercury, but it has rivals in the form of new arsenical preparations invented by Mouneyrat, which are said to be equally efficacious and less toxic. Moreover, the claims of antimony as an antisyphilitic drug are urged by Tsuzuki, who reports good results with a preparation of antimony similar to salvarsan in its chemical construction. No doubt other drugs and combinations of drugs will be introduced; but it is well to bear in mind that all these new therapeutic measures are on their trial, and that years must elapse before their individual or relative merits or demerits can be established—[C. F. M.]

ABDOMEN, GUNSHOT WOUNDS OF.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

Kahn's[1] article is based on thirteen cases in his own civil practice. He says that a greater number of visceral perforations may be expected if the bullet traverses the abdomen transversely or obliquely than if its direction be antero-posterior. In every case of penetration of the abdomen by a bullet, multiple perforations of the viscera are to be assumed, and prompt surgical exploration is demanded. Kahn does not think that deductions drawn from military experiences should be applied in civil work. Most army surgeons agree that more bullet wounds of the abdomen end favourably without than with operation; but several factors contribute to the bad results of operation in time of war, such as the delay and difficulty of transport, and the poor conditions often surrounding the operation. Probably, also, many cases die on the battle-field and so evade the statistics. In ordinary practice, when the bullet has clearly entered the abdomen, it is unwise to await symptoms. The chief difficulty arises when the wound of entry is so placed that its further course is uncertain. It is then necessary to be guided by symptoms, of which pain and muscular rigidity are the most important.

As a rule, the abdomen should be explored through a free median incision. If there is profuse hæmorrhage, its origin should be at once sought; when the bleeding is controlled, the viscera should be examined for perforations. If the bleeding is inconsiderable, the repair of perforations should be the first care.

Shot wounds of the intestine usually permit little extravasation during the early hours following injury, whereas wounds of the urinary bladder and gall-bladder, and large wounds of the stomach, allow an immediate escape of their contents. The perforation of any hollow organ usually involves two penetrations of its wall; hence an even number of holes should be sought.

Hæmorrhage from the liver is generally controlled by catgut or tape suture. Hæmorrhage from the spleen, if not controlled by packing or suture, calls for splenectomy. Severe injuries of the kidney are to be treated by nephrectomy. Lesser wounds may be treated by suture, and drainage from the loin.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1913, i, 955.

ABDOMINAL WALL, LIGNEOUS PHLEGMON OF.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

By ligneous phlegmon is meant a hard, board-like, painful induration in the subcutaneous connective tissues, which runs a very chronic course extending over months or years. Grant[1] reports two cases, one following a herniotomy and the other occurring in a patient after an attack of appendicitis.

The disease occurs generally after middle life, and when resistance has been impaired by previous ill-health. The immediate exciting cause is a slow infective process, with or without trauma. It appears to be due to a variety of germs of lessened virulence, and affects connective tissue, fascia, muscles, and finally skin.

The diagnosis is often exceedingly difficult, and malignant growths, syphilis, and tuberculosis have to be eliminated. The usually slow development, interrupted and protracted course, and final resolution, are characteristic.

Grant considers the best treatment to be free **Incision** and the injection of **Vaccines** directly into the hardened tissues.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1913, i, 1030.

ACANTHOSIS NIGRICANS.

E. Graham Little, M.D., F.R.C.P.

Klotz and Rohdenburg[1] report a new case of this rare disease, which was followed to its termination in visceral cancer, the usual association. The patient was aged sixty-two at the first appearance of the cutaneous affection, which showed itself in pigmentations of the hands, neck, axillæ, and genital area; in warty growths in various parts of the body; in thickening of the skin, which became "shark-like" on the hands; and in thinning and loss of hair. There was at first marked improvement under **Arsenic** administered by the mouth and subsequently hypodermically. About eighteen months after the cutaneous changes appeared, a small tumour was noted in the sigmoid flexure, and subcutaneous nodules developed. These continually increased in size; operation was declined, and the patient died six months later. The intestinal growth and the skin nodules alike were demonstrated to be spindle-celled sarcomata. The case recalls very strikingly, in all its details, including the intestinal malignant growth, the one recorded by the writer in the MEDICAL ANNUAL, 1910, with a coloured plate illustrating the clinical aspect of this disease.

REFERENCE.—[1] *Jour. Cut. Dis.* 1913, 306.

ACNE VULGARIS.

E. Graham Little, M.D., F.R.C.P.

Haase[1] reviews the very conflicting literature on the bacteriology of this disease, and comes to the conclusion that the confusion is due to observers having reported on different stages of growth in the same organism. He is inclined to agree with Gilchrist that *B. acnes* is the cause of all the various clinical manifestations of acne, comedo, and pustule.

He is satisfied of the value of acne **Vaccine**, which he has always used in stock cultures, and inclines to the small doses (3 to 5 millions) recommended by Engman and others. [*See also* SKIN, GENERAL THERAPEUTICS OF.]

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1912, ii, 504.

ACTINOMYCOSIS.

Herbert French, M.D., F.R.C.P.

A considerable number of new collected cases of human actinomycosis have been recorded by Foulerton[1] (78 cases) and McKenty[2] (47). The former lays particular stress on the fact that in many, an exact diagnosis on clinical evidence is impossible. In pulmonary infections the clinical symptoms and signs are those of chronic phthisis and it is only the occasional perforation of an intercostal space, possibly with subcutaneous extension of the infection, that may help in differentiating a case from one of infection by Koch's parasite. In only one of the fourteen cases of pulmonary streptotrichosis examined at the hospital was there any suggestion that the disease was other than an ordinary tuberculous phthisis until suspicion was raised by failure to find typical "tubercle bacilli" in the sputum, or until typical mycelial forms of a non-acid-fast streptothrix had been identified in the sputum. Equally a diagnosis by clinical methods of the specific kind of infection is impossible in acute streptotrichial infection of the appendix, or in any case unless there has been extension to the subcutaneous tissue. In the case of mouth infections, whilst there is nothing characteristic about the local abscesses which form in the cheek or neck, the situation of the swelling, and sometimes the occupation of the patient, may suggest a diagnosis.

Difficulties in the way of the positive identification of the parasite by laboratory methods arise from two sources: in the first place there is the extreme difficulty of obtaining growth of many parasites of this class on artificial media; and in the second, that arising out of the varying morphology of these species of mould at different phases of their life-cycle. It is now well recognized that the mycelial, or "ray fungus" form, represents only one of the three forms under which these parasites occur; and that typical mycelium, and the mycelium when, in the earlier stages of "fragmentation," it is breaking up into "rod forms," represent the only stage at which the parasite can be recognized positively by microscopic examination. At a later stage of development, when fragmentation of the mycelium is complete, and when sporulation has occurred, the picture is no longer that of a "ray fungus" —all that can be seen in a stained film is a collection of somewhat irregular "bacillary" forms, and spherical spores which exactly resemble the common pus cocci; and both forms stain deeply with Gram's method.

McKenty also shows how much more common human actinomycosis is, especially in rural communities, than is generally supposed. It is often mistaken for tuberculosis or new growth, on account of the difficulties of exact bacterial verification, or because the proper bacteriological investigations are not carried out as often as they should be. He gives a full account of the mode of origin of the pathological lesions that result from the infection. The incubation period varies from a few days in some jaw cases, to weeks or months in abdominal and pulmonary cases. In the latter, phthisis is generally simulated and diagnosed. The disease spreads by contiguity and along the bloodstream, rarely by lymph-channels. The pus from the cavities is small in quantity, has a peculiar earthy odour is usually blood-stained, and contains the characteristic sulphur-yellow granules, which in cattle possess a very gritty feel, and are found under the microscope to be colonies of the organism. The central part of a colony consists of a mass of filaments (mycelium) which form a dense felted network. At the periphery there are large pear-like forms which have received the name of clubs; coccus-like forms (probably cross-views of filaments) are also present. The clubs appear to be the swollen terminal extremities of the filaments. They are more frequently met with in cattle than in man, and are more abundant in chronic cases. The organism grows with so much difficulty on all ordinary media that cultural methods are of no practical value to the clinician.

TREATMENT.—The curative value of **Vaccines** in cases of actinomycosis is emphasized by Collie.[3] His patient was confined to a couch, pale and emaciated, with a large suppurating actinomycotic abscess in the left iliac fossa, a second in the left costal margin in the nipple line, and a third between the shoulders. Potassium iodide had been given freely, but wholly without effect. The patient was wasting rapidly, and hope of his cure had been given up. Stock vaccine was then resorted to, and between November and March he was given seventeen injections in all, in doses of between five and seven and a half millions. The last few inoculations were autogenous, the remainder from stock; improvement set in soon after the treatment was started, and within six months the man was back at work; he had put on weight, looked the picture of health, the groin trouble had disappeared entirely, and the two other places were almost gone, though at the time of reporting they were still present as small healing wounds.

REFERENCES.—[1]*Lancet*, 1913, i, 381; [2]*Amer. Jour. Med. Sci.* 1913, i, 835; [3]*Brit. Med. Jour.* 1913, i, 991.

ADDISON'S DISEASE.

(Vol. 1914, p. 86.) Munro recorded a case in which prolonged administration of **Tuberculin** appeared to effect a cure.

ADENOIDS.

W. G. Porter, M.B., F.R.C.S.

Sobotky[1] points out that in a considerable number of cases mouth-breathing persists after the removal of adenoids, and that in such cases the nasal breathing exercises have not proved efficient. Operative treatment of the nasal condition, e.g., reduction in size of the turbinals, is then indicated. If the palatal arch is high, spreading the arch and regulation of the teeth are of value.

Grove[2] has met with two cases of *infection of the nasal accessory sinuses* following the removal of adenoids, in one case of the frontal sinus and in the other of the anterior ethmoidal labyrinth. Infection appeared two weeks after operation. He refers to other complications which may arise, viz., general septicæmia, all of the acute infectious diseases of childhood, adenitis, erysipelas, post-operative lung infections, and meningitis. He concludes that more care should be taken in after-treatment than is usually the case, and if possible the patients should be admitted to hospital and not treated as out-patients. Jolly[3] records a case of *osteomyelitis of the sphenoid bone* following removal of adenoids in a child, aged 5. He was seen by the author seventeen days after the operation, which had been performed elsewhere, apparently suffering from septicæmia and with symptoms of cavernous sinus thrombosis. He died in four days, and at the autopsy the entire body of the sphenoid bone was found to be broken down and infiltrated with pus, and there was widespread basal meningitis. The infection had apparently started in the nasopharynx.

Treatment of Adenoids without Operation.—Astley[4] believes that adenoid hypertrophy is an attempt to make up for deficiency in the other lymphoid tissue of the body. He has accordingly treated these cases with **Lymphatic Gland Extract**, and believes he has had good results.

REFERENCES.—[1]*Bost. Med. and Surg. Jour.* 1914, i, 290; [2]*Johns Hop. Hosp. Bull.* 1914, 115; [3]*Lancet*, 1914, i, 1254; [4]*Brit. Med. Jour.* 1914, i, 1160.

ALBUMINURIA.

Francis D. Boyd, M.D.

Its Relation to Life Insurance.—All are familiar with the albuminuria of adolescents. If the cases be followed up through life it is found that albuminurics in their teens and twenties lose the abnormal symptoms in later life. It is important from the life insurance point of view to separate such cases from those in which the albuminuria is a sign and a part of grave organic disease.

R. Scot Skirving's experience of one year included the following totals of albuminurics examined:—

Sex		[illegible]	[illegible]	[illegible]	[illegible]
Male	Female				
141	15	17	133	6	156

Of the total lives applying for insurance the albuminurics form 2 per cent. In classifying any case as functional and not organic, the following points are of importance: (1) Absence of any recent cause for nephritis, such as exanthemata, diphtheria, or a clear history of ordinary antecedent acute nephritis with its classical signs; (2) Absence of any of the ordinary stigmata of chronic renal disease, especially cardiovascular changes; (3) The fact that the proponent is under twenty-five, and presents a healthy appearance; (4) That the urine is of a good or even high specific gravity; (5) That the albumin is very slight or moderate in amount—that it is not constant, i.e., it is often absent at certain hours of the day, and its appearance is frequently influenced by exercise, by food, or by cold; (6) That microscopical examination of the urine reveals no important suggestive abnormality; (7) That the blood-pressure is not unduly high.

If the facts taken generally are in favour of the proponent, and he or she is under twenty-five years, life may be accepted at rate for age; if the proponent is over twenty-five and under thirty, the proposal in some cases may be accepted at ordinary rates, or with a moderate loading. If over thirty, the life should be deferred or heavily loaded. From an actuarial standpoint, according to the author, calculations show that if out of 100 lives diagnosed as functional albuminurics the medical examiner classes 50 as select, and 50 not quite select, and of these latter, 10 cases turned out badly and died, say at one half their expectation of life, while the remaining 40, together with the 50 taken as select, lived out their full expectation, it would then be necessary for the protection of the society to load the whole 50, which are not definitely first class, at the rate of about five years.

MacLaurin[1] urges that all adolescent albuminurics should be classified as *increasing risks*, because, while there is abundant evidence that they may reach middle life in safety, evidence is wanting as to their progress after the forties; and, moreover, it is certain that in a fair proportion the albuminuria is due to some latent condition of ill-health, such as carious teeth, or some other toxæmia which is not likely to conduce to long life. As scientific selection is impracticable in life assurance work, the fairest way to treat all apparently healthy young albuminurics is to lump the good with the bad, and classify them all as increasing risks, and insure them under a double endowment table specially adapted for such. The policy of loading them all to five years MacLaurin does not approve of, because at the age of fifteen to eighteen a three to five years' loading is so trifling as to have little effect beyond irritating the proponent, and is really not worth putting on.

In cases where there is a possibility that real organic disease, though latent, may be present, it is wise to propose three to four years' conditions, i.e., if death occurs within three to four years, to return the premiums with 3 per cent compound interest.

REFERENCE.—[1]*Austral. Med. Gaz.* 1912, 455.

ALOPECIA AREATA.

E. Graham Little, M.D., F.R.C.P.

Pellizari[1] regards alopecia areata as of complex causation, in which the nervous factor predominates; it must be looked upon as a symptom of general illness, a view in which he was supported by many speeches in the subsequent discussion. He found good results in many cases from treatment by **High Frequency**, which, however, failed completely in some. The application of **Violet** and **Ultra-violet Rays**, of **X-rays**, manual and instrumental **Massage**, **Bier's Method** of inducing hyperæmia, and **Freezing** by carbon dioxide snow are also mentioned as having given good results.

Sabouraud[2] claims that alopecia areata can no longer be regarded as an infectious disease after Jacquet's work on the subject, but he regards that author's reflex theory as true only of a certain proportion of cases, chiefly of those of scanty and unilateral distribution. The more widely spread cases are symptomatic of a general disease, which is also marked by changes in the nails, and frequently associated with vitiligo, lupus erythematosus, psoriasis, Graves' disease, tuberculosis, syphilis, and other general infections. There is a group of causes which may be classed as genital, comprising the menopause in women, and castration in men. Alopecia is hereditary in 25 per cent of the cases recorded. The most promising advances in treatment would follow from an investigation of the connection of the disease with disorders of secretion of the internal glands. Emlyn Jones[3] made an interesting comparison of 50 cases of alopecia areata with 50 cases of surgical out-patients. The incidence of dental caries was much the same in both series. He considers that Jacquet's theory of reflex nerve irritation as explaining alopecia areata rests on too slight evidence to be very convincing.

REFERENCES.—[1] *Proc. Internat. Congr. Med. Section xiii*, pt. i, 15; [2] *Ibid.* 23; [3] *Brit. Jour. Dermatol.* xxiv, [illegible]

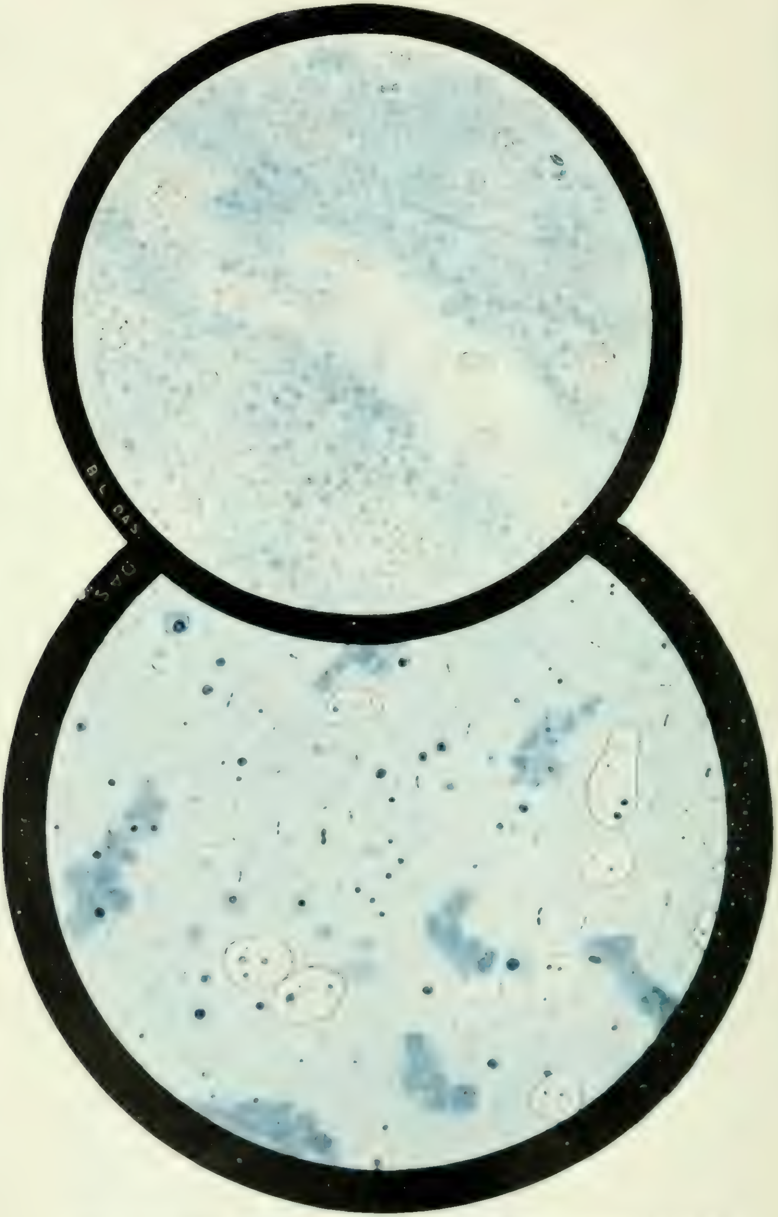
AMŒBIASIS. *Leonard Rogers, M.D., F.R.C.P.*

ETIOLOGY.—A good deal of confusion still exists regarding the *varieties of entamœbæ* and their differentiation from each other. The present tendency is to attribute amœbic dysentery mainly to *E. tetragena*, while doubts are thrown on the correctness of Schaudinn's description of *E. histolytica*. Darling[1] now thinks that the former is the only pathogenic amœba found at Panama. The diagnostic point of *E. tetragena* he considers to be the presence of chromatin in the protoplasm outside the nucleus. In kittens fed on *E. tetragena* cysts the disease was produced, with forms resembling both *E. histolytica* and *tetragena*. In stools of recovering cases, small refractile homogeneous cysts are found, 15 microns in diameter, which after a day or two in a moist chamber develop two to four nuclei, and young amœbæ are formed later. As these cysts only are infective, they should be sought for. He has confirmed the fact that the commonest site of amœbic ulcers is in the cæcum, when ill-defined abdominal pain and some diarrhœa are alone present. In a further paper[2] he points out that polychrome-blue eosin stains give a purple colour to quite a different part of the nucleus from that which is deeply stained by hæmatoxylin, which may be a source of confusion if not carefully borne in mind.

W. M. James[3] deals with the identification of entamœbæ by simple clinical microscopical methods in unstained samples of stools. In the

PLATE IV

AMŒBIASIS



[illegible] A [illegible] B [illegible]

[illegible]

harmless *E. coli* the nucleus is plainly visible, generally rather central, while it retains its circular shape during movement of the organism. The endoplasm is always grey, and only slightly differentiated from the ectoplasm during motion, with extruded pseudopodia. On the other hand, in *E. histolytica* the nucleus has scanty chromatin, so is not easily seen, and it becomes elliptical during movement. In *E. tetragena*, however, the nucleus is prominent as in *E. coli*. The ectoplasm of *E. histolytica* and *tetragena* is clearly differentiated from the endoplasm, while movement is more rapid with well-defined pseudopodia, which is quite distinctive from *E. coli*. The endoplasm is commonly of a greenish tinge and contains numerous red corpuscles. James has seen many patients treated with quinine enemata, etc., when only harbouring the harmless *E. coli* and without bowel symptoms, although colitis often developed as a result of the treatment, so the simple differentiation of the harmless from the pathogenic entamœbæ is important. Craig[4] has recently altered materially the views expressed in his work on amœbæ, and now considers that *E. histolytica* and *E. tetragena* are one and the same species, having found all the stages hitherto described in either species in single infections.

L. Rogers[5] deals with the monthly distribution of dysentery in relation to the *rainfall* in different parts of India, clearly showing the increase of the disease during the monsoon rains. The proportion of liver abscess cases to dysentery is very uniform in the British army throughout India, proving that amœbic dysentery is very widespread. Since he showed that large doses of ipecacuanha would prevent early hepatitis, the number of cases and deaths from liver abscess has greatly fallen among British soldiers in India. Amœbic disease of the bowel frequently causes no symptoms apart from diarrhœa, and in Calcutta no less than 40 per cent of the fatal cases as seen post mortem had not been diagnosed or treated as dysentery during life, but were usually returned as "diarrhœa" and "tuberculous diarrhœa." The importance of examining the stools of all diarrhœa cases for amœbæ in warm climates is thus clear. In the majority of cases of amœbic disease the organisms can be found within a few minutes by a simple microscopical examination of the stools, but in some, especially in chronic disease, repeated examinations are necessary to detect them. When they are scanty, the search is facilitated by adding a drop of 1 per cent watery methylene blue to a piece of mucus and first searching with a low power ($\frac{1}{2}$-in. lens). In such specimens the cells stain blue, but for a time the amœbæ remain unstained, and hence are easily found with a little practice (*Plate IV*).

M. Couteaud[6] deals with secondary *abscesses in the brain* related to suppuration in the liver and lungs, some of which were apparently amœbic in origin.

TREATMENT.—L. Rogers[7] records further experience of his **Emetine** treatment of amœbic dysentery. He compares the results of 30 cases treated with ipecacuanha with 26 who were given hydrobromide and hydrochloride of emetine hypodermically. Of the 30 ipecacuanha cases

11 died and 2 were removed by their friends in a dying condition. Of the 11, 4 died within three days of admission in a hopeless state. Of the total, 13 were discharged cured and 1 much improved; 3 more were discharged no better. Of the 26 emetine cases, 2 died within two days of admission in a hopeless condition. Two more recovered completely from the dysentery, but died of other diseases. The remaining 22 were all cured, their stools becoming normal in an average of 2·35 days, against 11·4 days in the cured ipecacuanha series, and they were discharged in an average of 7·2 days, against 16·4 days by the older treatment. No cases were discharged uncured. The average dose of emetine hydrochloride to cure a patient was 2 gr., against 400 gr. of ipecacuanha. He discusses the question of the permanency of the cures, and records evidence in patients dying later of other diseases to show the amœbic ulcers had completely healed, but considers it too early to answer the question in the affirmative, although so far all the evidence points that way. He has given up to one grain of the hydrochloride intravenously, dissolved in 60 min. sterile saline, with good effect and no sickness. Given by the mouth in salol coated pills, emetine is much less effective than hypodermically, while one case relapsed in a few days.

W. Allan[8] records two cases confirming the above results. One was remarkable for the fact that 60 gr. doses of ipecacuanha in salol coated pills had failed after full trial. The first hypodermic dose of the new drug caused great pain and did no good, and was found on analysis to contain no emetine. Ipecacuanha again failed, but a fresh supply of emetine eventually cured the patient, although not until a 4 gr. dose had been given. [It would be interesting to know the weight of the man.—L. R.] J. W. Lawson[9] records a case of amœbic dysentery of ten years' duration cured in a few days by a total of 2¼ gr. of emetine hydrochloride in nine doses. J. Preston Maxwell[10] gives notes of ten cases, and concludes that the claims put forward have been abundantly justified, for whereas he formerly dreaded the arrival of these cases, he now welcomes them. Amœbæ were found in the stools of each before treatment, but they rapidly disappeared. All the cases were cured and he had seen no relapse. A. C. Hutcheson[11] also reports 13 cases, and concludes that emetine in amœbic dysentery is wonderful in its efficacy. In 2 out of 3 cases of schistosomum infection the blood disappeared from the stools in six days under emetine, but in the third case it failed. R. Lyons[12] also reports favourably on 6 cases with no relapses up to date. G. Baermann[13] has recorded most important observations on emetine in amœbic dysentery in Sumatra, having been able to follow up his cases for considerable periods. Some were in a very advanced stage of the disease, and, although the symptoms cleared up, the patients eventually died from the damage already inflicted on the bowel wall, as in some of Rogers' earlier cases. He used the drug intravenously in severe cases, as advised by Rogers, with good effects. Occasionally in fatal cases a few encysted amœbæ were found surviving in the bowel wall.

thus accounting for occasional relapses. He therefore advises the emetine injections to be continued every few days for some little time after the symptoms have disappeared, to prevent relapses. He concludes that the new method is a very important advance, and leads to an effective treatment of amœbic dysentery, the scourge of the East.

Chauffard[14] has also confirmed the remarkably rapid specific action of emetine in both amœbic dysentery and liver abscess. In one patient, who had been coughing up much liver pus for several months without improvement, a cure was effected with emetine in a few days. The same writer[15] reports another case of hepatic abscess with copious discharge of pus through an operation wound in the chest wall, in which, when little progress was being made, the discharge ceased in a very few days under subcutaneous injections of emetine. Rouget and Flandin record similar good results in Madagascar. Milian obtained good results from emetine injections in some cases of syphilis, but it failed in others.

S. Mallannah[16] records a case of large liver abscess following dysentery, in which after three aspirations the patient was still very bad and refused the open operation. Under emetine by the mouth, the fever ceased, the diarrhœa stopped, and within a month the liver became reduced to its normal size and the patient recovered, having taken 21 grs. of emetine in ¼-gr. doses.

Verteuil[17] records a remarkable case of amœbic dysentery complicated by liver abscess on three occasions, and lasting three years and a half, which was cured in a few days by injections of emetine hydrochloride. G. C. Low[18] found emetine by the mouth, in keratin-coated pills, effective in a mild amœbic dysentery. J. H. C. Thompson[19] records his experience on tea estates in Cachar during the last seven years, where in some places as much as 25 per cent of the sick list is due to dysentery. The ipecacuanha treatment was often refused on account of the sickness induced. Emetine, on the other hand, has been found very satisfactory, and as no less than 85 per cent of the cases were amœbic, he considers that "we have in the treatment of dysentery by injections of emetine hydrochloride, a powerful, reliable, and scientific method, the value of which it would be difficult to estimate." Sir C. P. Lukis,[20] in the bacillary form, relies on vaccines, antidysenteric serums, and salines, and in the amœbic on hypodermic injections of emetine hydrochloride. M. Maurin[21] has obtained good results with an enema of 4 grams of ipecacuanha in 200 grams of water daily in one case of amœbic dysentery, which was cured in about eleven days. F. F. Elwes, Webster, and Ingram,[22] working at the Madras General Hospital, testify to the valuable effects of emetine in amœbic dysentery and hepatitis. D. C. H. MacArthur[23] cured a case of hepatitis and a liver abscess with the drug.

S. H. Wadhams and E. C. Hill[24] record three cases of amœbic dysentery treated with **Salvarsan,** in only one of whom was the Wassermann reaction positive, yet the dysentery appears to have been cured in each. The authors consider the cases too few to draw conclusions from, but think it worthy of further trial.

L. G. Fink[25] reports a case of liver abscess treated by a modification of Rogers' method of **Aspiration** and injection of **Quinine.** Fink used a trocar and cannula for evacuating the abscess; he irrigated the cavity with sterile saline and injected the quinine solution, and repeated the operation on subsequent occasions, with ultimate recovery of the patient.

H. G. Beck[26] suggests using Einhorn's duodenal tube for getting ipecacuanha into the intestine. A two-ounce metal syringe was used to instil the remedy, which consisted of one to two drachms of ipecacuanha in mucilage or water in a six-ounce mixture. The results were good in severe cases, being better than by oral administration.

W. E. Deeks[27] records further good results with his **Bismuth** treatment, which was described in last year's ANNUAL. During the past year only 21 out of 110 admissions to the Ancon Hospital were found to be due to the *E. histolytica*, which is the cause in nearly all his cases. In one case, in which the *E. tetragena* was present, it was found that the bismuth method was powerless. He thinks bismuth acts by removing putrefactive changes in the large bowel, which are essential to the protozoal parasites, and which persist longer in the appendix than in the cæcum. In the thirty months up to December, 1911, 74 cases had been treated, with 9 deaths, mostly from complications such as liver abscess. Among 65 cases under the bismuth treatment, only 1 died. Relapses and hepatic complications were also prevented by the treatment, of which saline enemata and milk diet form an important part.

REFERENCES.—[1]*Proc. Canal Zone Med. Assoc.* 1912, iv, Pt. ii, 122; [2]*Jour. Trop. Med. and Hyg.* 1912, 2; [3]*Ibid.* 152; [4]*Jour. Amer. Med. Assoc.* 1913, i, 1353; [5]*Lancet,* 1912, ii, 1062; [6]*Rev. de Chir.* 1913, July, 30; [7]*Ther. Gaz.* 1912, 518, and *Ind. Med. Gaz.* 1912, 421; [8]*Jour. Amer. Med. Assoc.* 1913, i, 1094; [9]*Brit. Med. Jour.* 1912, ii, 703; [10]*China Med. Jour.* 1913, Mar.; [11]*Ibid.* 1913, 243; [12]*Jour. Amer. Med. Assoc.* 1913, i, 1216; [13]*Münch. med. Woch.* 1913, 1132 and 1210; [14]*Presse Méd.* 1913, 380; [15]*Jour. Amer. Med. Assoc.* 1913, i, 1806; [16]*Brit. Med. Jour.* 1913, i, 1206; [17]*Lancet,* 1913, i, 1803; [18]*Brit. Med. Jour.* 1913, i, 1360; [19]*Dublin Med. Jour.* 1913, ii, 102; [20]*Brit. Med. Jour.* 1913, i, 3157; [21]*Lancet,* 1913, ii, 942; [22]*Ind. Med. Gaz.* 1913, 324; [23]*Brit. Med. Jour.* 1913, ii, 551; [24]*Jour. Amer. Med. Assoc.* 1913, ii, 183; [25]*Jour. Trop. Med. and Hyg.* 1912, 330; [26]*Jour. Amer. Med. Assoc.* 1912, ii, 2110; [27]*Ibid.* 1913, i, 35.

AMPUTATIONS.

Priestley Leech, M.D., F.R.C.P.

Estes[1] has studied the results of 724 *major amputations* done in his clinic, and concludes as follows: The medio-tarsal amputations have increased in number and gained in favour against Syme's in the amputations in the lower third of the leg. As little as possible should be removed except in the upper third of the leg; it is better to amputate at the knee-joint than in this region.

For the forearm, antero-posterior flaps with the posterior one-quarter longer are to be preferred; in amputations of the arm, a circular or modified circular incision; at the shoulder-joint also antero-posterior flaps are preferred. The anterior flap includes the greater part of the deltoid muscle, and is longer than the posterior one. Mediotarsal and tarsal amputations are preferred whenever practicable when amputation of the foot is required. It is especially necessary to obtain adequate flaps, and to cut the anterior tendons long enough to be secured by sutures to the posterior flap when forming the stump. Low down in the leg antero-posterior flaps are preferred, but not the Teale or any extraordinarily long anterior-flap method. In other parts of the leg lateral flaps seem best. At the knee-joint a long anterior is combined with a short posterior flap ; the patella may be removed or not. In the thigh, antero-posterior flaps are best, with the anterior one longer. They are always shaped from without inwards, never by transfixion.

The mortality is 4·56 per cent for single amputations. The important factors in lowering the mortality of amputations for injuries are saving of blood, careful asepsis or antisepsis, and discrimination as to the time of operation. The blood-pressure is a useful guide ; a systolic pressure below 80 mm. should contraindicate amputation.

Interscapulo-thoracic Amputation.—Carson[2] reports two successful cases of this operation, one for epithelioma following an old burn on the arm, and the other for a small round-celled sarcoma of the humerus. He used ether by the insufflation method, and injected cocaine into the large nerve trunks. One patient was out of bed on the fifth day. Sufficient time has not yet elapsed since the operation to say whether recurrence will take place or not. He thinks it should be performed oftener than is reported for injuries of the shoulder, including gunshot wounds, extreme bone disease of the shoulder and upper arm, all cases of sarcoma of the arm and shoulder except possibly those of giant-celled sarcoma limited to the lower two-thirds of the humerus, all cases of carcinoma involving the upper half of the arm, and some cases of carcinoma of the breast where the axilla and arm are involved. In some cases of tuberculous disease it is also indicated.

REFERENCES.—[1]*Ann. Surg.* 1913, ii, 39 ; [2]*Ibid,* i, 796.

ANÆMIA IN CHILDREN.

Frederick Langmead, M.D., F.R.C.P.

Tixier[1] points out that the features of this condition peculiar to infants are the frequency and intensity of the myeloid reaction whatever the degree of anæmia, the rapid and striking fall in the colour index, and the frequent association of the reactions of the spleen and marrow, producing a pseudo-leukæmic form of anæmia. A study of the blood-forming organs shows a condition of exalted activity and exhaustion of the bone-marrow. In some cases the condition of the blood corresponds to that of the marrow, but in others, notably in hereditary syphilis, this does not hold true. The form of leucocyte does not always give precise information as to the cause of the anæmia, though a persistent increase in mononuclear cells and myelocytes is strongly suggestive of syphilis.

French physicians have differentiated a type of anæmia characterized especially by a considerable decrease in the amount of hæmoglobin, which they have termed *anémie pseudo-chlorotique*. It is related almost always to defective nutrition. According to Leuret, hæmolysis plays the leading part in the production of anæmia in infants, and may be present in every degree, from the rapid cell destruction which occurs in hæmolytic jaundice, to the slight but prolonged hæmolysis which betrays itself by anæmia of varying severity with or without splenomegaly. Anæmia of pernicious type would appear to be less rare in infants than has generally been supposed, and may be secondary to hereditary syphilis, septicæmia, middle-ear disease (Ribadeau-Dumas and Poisot), to pyelonephritis (Carpenter), to abdominal tumour (Ribadeau-Dumas and Camus), to a combination of diseases (Tixier), or to causes unknown (Cristina).

R. Jemma[2] describes a peculiar form of anæmia which is endemic to the shores of the Mediterranean. It runs a chronic course and especially affects infants in the first year of life, being characterized by fever, anæmia, progressive enlargement of the spleen, and wasting. It is due to infection by a parasite identical with that which Leishman and Donovan have discovered in India in patients suffering from kala-azar, and is generally fatal. As long ago as 1880 Cardarelli named it infective splenic anæmia of infants. Pianese discovered the pathogenic agent in 1905, and in 1908 Nicolle obtained a pure culture and inoculated it into a dog. Although there is still considerable difference of opinion, recent work tends to show that the disease is identical with kala-azar or tropical splenomegaly. It is transmitted from dogs to man by fleas, especially affecting children of the poorer classes of from one to three years of age.

The incubation period is unknown. The onset of the disease often passes unnoticed, and is characterized by fever and gastro-intestinal disturbance. When it has developed, the principal features are fever, anæmia, and enlargement of the liver and spleen. Increasing feebleness and wasting lead to cachexia, or death may intervene before cachexia has developed. In the later stages, intractable diarrhœa and marked emaciation may occur. Death may be due to intercurrent diseases, such as pneumonia, noma, hæmorrhage, œdema of the glottis, nephritis, or sudden fatal dyspnœa. Jemma examined the blood of fifty-four cases. The hæmoglobin was always diminished. Usually the red cells were markedly reduced, whilst anisocytosis, poikilocytosis, and nucleation were rare. Polychromatophilia was common. The colour index was variable but usually diminished. Leucopenia was the most characteristic feature. Lymphocytes were the white blood-cells in greatest abundance. There were never leucocytosis or persistent marked alterations in the red cells such as are found in other forms of anæmia in infants.

Czerny[3] emphasizes the importance of distinguishing between anæmia and pallor. For pallor to constitute anæmia, it is necessary for the mucous membranes to be pale as well as the skin, and for examination of the blood to show a decrease in hæmoglobin and in the number of cells. Pallor of vasomotor origin occurs in nearly all the gastro-intestinal disorders of children, and is often their first symptom.

On the other hand, anæmia so produced is almost confined to the first two years of life. According to Czerny, insufficient nourishment is not the cause of the anæmia, but in his experience it has developed exclusively in certain infants fed for a long period entirely on milk. The reason why some infants fed thus develop anæmia, whilst others do not, he ascribes to a congenital anomaly. In some cases, pallor and blood changes are the only signs of anæmia, in others the spleen enlarges. The connection between obesity and anæmia due to alimentary disturbance is so close, that if the former is not present, grave suspicion should be entertained of the alimentary origin of the anæmia. Besides obesity, infants suffering from this form of anæmia develop softness and flabbiness of the muscles, but growth is not affected.

TREATMENT. As Tixier remarks, among therapeutic agents administered to stimulate blood-production are **Iron, Arsenic, Extracts of Ductless Glands, X-rays,** and the **Hæmatinic Serum** of Carnot. For each form of treatment a certain number of successful cases are claimed, but it is difficult in a given case to determine which is indicated. Mild or moderate forms get well under the influence of ordinary remedies. Treatment directed against hæmolysis has met with only a small measure of success. The attempt to utilize the anti-hæmolytic power of **Cholesterin** has only led to transitory results. For the endemic anæmia resembling kala-azar, Jemma advocates the destruction of infected dogs and of fleas. The child should be isolated. Therapeutic measures such as **Quinine, Atoxyl, Biniodide of Mercury,** and **Iodine** have, at present, given only negative results. **Salvarsan** has been disappointing. **Radiotherapy** has also proved useless. **Arsenical Preparations** have given the most encouraging results. Splenectomy is not indicated, for the parasites are found as commonly in other organs.

For the anæmia due to *alimentary* causes, Czerny, believing that it is due to an exclusively milk diet, recommends that treatment should be devoted to remedying the defect either by adding other forms of food or by medicines. When these measures fail, milk should be prohibited altogether. Iron is of no avail if the infant is left on the diet which caused the anæmia. Improvement often follows if the milk diet is supplemented by foods rich in iron, such as eggs, fruit, and spinach or other green vegetables. At the onset, or in mild cases, all that may be necessary is to reduce the quantity of milk to one-third or one-half, and supplement it by adding vegetables, gruel, rice, tapioca, or fruit. In grave cases milk must either be stopped altogether or reduced to 100 or 200 gr. daily. In addition, meat may be given twice daily. Under this régime he states that the most severe cases of anæmia may be cured in three or four months. [The value of meat juice and meat-juice preparations should not be forgotten in these cases.]

Splenic anæmia of the adult type is little benefited by medical measures, and for patients suffering from this condition **Splenectomy** would appear to offer the greatest hope of cure. Thus Burghard and

Sutherland[4] record two cases of the familial type successfully treated in this way. One was a girl, aged 13, the other also a girl, aged 6½. The general condition and state of the blood in both became normal and they are now in good health, the former seven years and the latter three years after operation. Makins[5] and Hutchinson[6] have each recorded a successful case. Probably the youngest child cured by this measure is a girl, aged 5, operated upon in 1895 by Bland-Sutton,[7] who mentions that she has become a healthy attractive woman, and now works as a compositor.

REFERENCES.—[1]*Presse Méd.* 1912, 841; [2]*Ibid.*; [3]*Ibid.* 842; [4]*Proc. Roy. Soc. Med.* 1911, iv (*Clin. Sect.*), 58-70; [5]*Ibid.* 1913 (*Surg. Sect.*) 240; [6]*Ibid.* 250; [7]*Ibid.* 257.

ANÆMIA, PERNICIOUS. (*See also* SPLENOMEGALY.)

Herbert French, M.D., F.R.C.P.

ETIOLOGY.—Bartlett[1] reports a remarkable instance in which, out of a family of eight persons, four deaths from pernicious anæmia occurred within thirty years; all the patients lived all their lives on one farm. The diagnoses were confirmed by autopsy, and every effort was made to exclude the possibility of parasitic infection. Examples of family pernicious anæmia have been recorded previously, but they are rare. In one of Bartlett's cases, in which the Wassermann reaction was negative, an intravenous injection of salvarsan was given without any benefit.

Several observers have stated that they have found a *lipoid substance in extract of the gastric mucosa* of pernicious anæmia cases having very much greater hæmolytic powers than have similar extracts of other human stomachs. Results of this kind have been quoted extensively as supporting the view that the toxin responsible for the blood-destruction which produces pernicious anæmia is produced in the walls of the stomach. Ewald and Friedberger,[2] however, have made careful extracts from the stomachs of two fatal cases, and find that these have no hæmolytic action on either whole blood or on red blood-corpuscles, either with or without the addition of complement.

Carcinoma of Bone-marrow.—Carcinoma often produces a facies and general appearance that suggests pernicious anæmia, but in nearly all such the colour index is low instead of high, so that by means of blood-counts pernicious anæmia can be either diagnosed or excluded. An important exception to this rule arises, however, when carcinoma leads to metastases in the bone-marrow; for the blood picture may then simulate that of pernicious anæmia very closely. Harrington and Kennedy[3] record two cases in point. The first was a woman, 64 years of age, whose symptoms pointed somewhat indefinitely to cancer of the stomach. Bone pains were marked. She had a severe anæmia of a peculiar type, showing marked diminution of the red cells, high colour index, granular basophilia, polychromatophilia, slight poikilocytosis, megalocytosis, a relative lymphocytosis, and the *constant* presence of numerous myelocytes and erythroblasts, the majority of which were megaloblasts. Post mortem a carcinoma of the stomach was found, with metastases involving the marrow of several bones. In the second case, the diagnosis of carcinoma of the stomach was obvious, but the appearance was very similar to that of pernicious anæmia, and the blood showed a high colour-index, pronounced anæmia, megalocytosis, slight polychromatophilia, at first a relative lymphocytosis, a moderate number of myelocytes, and a few normoblasts and megaloblasts. From the similarity of the blood picture to that of their first case, they diagnosed secondary metastases in the bone-marrow, and this was confirmed post mortem. A prominent feature of both these cases was pain all over the body, but particularly in the long bones. The authors conclude that in any case of grave anæmia, the presence of pains and tenderness of the bones should always arouse suspicion of carcinoma of the bone-marrow. If the blood on examination shows characters suggestive of pernicious anæmia, but with an excess of erythroblasts and myelocytes, the diagnosis of metastases in the bone-marrow is highly probable.

SYMPTOMS.—Michell Clarke[4] draws attention to certain differences in the course of pernicious anæmia in *persons over fifty*, as compared with the course of the malady in younger persons. It tends to be more chronic in the old; to have a less pronounced degree of anæmia when it is first recognized; to show less tendency to the remarkable ups and downs of younger persons; fewer hæmorrhages other than retinal; whilst blood-films, though presenting abundance of macrocytes, tend to be remarkably free from megaloblasts and normoblasts except at the very end. He treated two of the eight cases with salvarsan; one benefited little, if at all; the other improved rapidly and enormously.

The yellow tinge of the skin in pernicious anæmia often leads to a suspicion that the patient is jaundiced, but true *jaundice*, with yellowness of the conjunctivæ, is distinctly rare in this malady; nevertheless Poynton and Pedler[5] draw attention to the fact that it may occur, and report one case in full. There was no bile pigment in the urine, the condition being of the type known as acholuric jaundice. Both arsenic and neo-salvarsan were tried in their patient, but neither seemed to exert any beneficial effect. Their case was discussed before the Medical Society of London, and notes of three precisely similar cases were contributed by Box and Taylor.[6]

TREATMENT.—Opinions are still divided as to the value of **Salvarsan** in the treatment of pernicious anæmia, some observers believing that it does harm instead of good. Apparently it is impossible to forecast which cases will do well with it and which badly; but that it often relieves materially when other remedies have failed seems certain. Byrom Bramwell[7] gives the results in 11 cases: 4 were apparently cured, though naturally they may relapse again; in 2 there was striking improvement; in 1 a marked temporary benefit but subsequent relapse and death; in 2 there was no improvement; 1 was still under treatment; and 1 was beginning to improve, but developed bronchopneumonia and died. He gives the salvarsan intramuscularly in doses of about 0·3 gram, and at intervals of from a week to a month. The number of doses given in each case varied from one to four. Few authorities hold that syphilis is a cause of true pernicious anæmia, but the syphilitic taint is so common that it would be surprising if it did not coincide with pernicious anæmia sometimes. Weichsel[8] records and quotes typical cases in point.

Boggs[9] records four cases treated by salvarsan; all showed a favourable reaction to this treatment as regards the regeneration of the blood and the relief of symptoms. One was a very remarkable apparent cure of a patient in his fifth relapse who had become quite unresponsive to Fowler's solution. In all the Wassermann reaction was negative.

Hobhouse[10] also records a case of remarkable benefit from the use of salvarsan in pernicious anæmia. His patient was extremely ill in a relapse of the disease which had previously responded to arsenic; 0·3 gram salvarsan was given intramuscularly on May 31. Improvement was obvious within three days, but there was a good deal of pain at the site of injection for over a week. A second similar dose was given on June 14th, and it was followed by a severe reaction. Hobhouse gives it as his opinion that a second injection should always be postponed as long as there is still progressive improvement from the first. That salvarsan fails to benefit some cases, however, is only to be expected; Byrom Bramwell points this out, and others have found the same. Maynard[11], for instance, records a case in which, though there was slight increase in the red cells after a first injection of 0·3 gram salvarsan given intramuscularly on October 15, a definite decrease followed a second injection on October 28, and there was no subsequent improvement.

Amongst the newer remedies applicable to the treatment of pernicious anæmia, **Thorium X** is likely to attract much attention. Thorium itself is one of the radio-active metals; various products and emanations are obtainable from it; thorium-X is one of these, prepared by submitting a solution of sodium chloride, [illegible], to the action of radiothorium. It may be given therapeutically either through the mouth or by injection into a vein; its strength can be measured in Mache units by means of a special electroscope. Its "life" is five and a quarter days. A succinct account of it, and of its use in pernicious anæmia, is given by F. E. Park.[12]

The observed fact that after twenty-four hours the greater part of the thorium-X that had been given to dogs could be recovered from the red marrow of the bones, directed the attention of investigators to its action upon the blood. Then it was found that there was a remarkable stimulation exercised upon the red-cell formation. This discovery was eventually made use of by A. Bickel, professor of internal medicine at the University of Berlin.

Up to September, 1912, there had been 9 cases treated by this method. Three of these showed no effect, and probably were cases of so-called secondary pernicious anæmia, for in such cases it has been observed that thorium-X has no effect. The other 6 cases responded in the same manner as did that of Bickel's, and are apparently cured.

Park's case, in a man of forty, is described as follows :—

"The previous history up to the time of his present disease is negative, save for a severe attack of yellow fever in 1888. He fully recovered from this, and for many years has led an athletic life. While teaching at college in 1906, his health began to fail, and in May, 1897, he consulted an eminent hæmatologist in the University of Michigan, and was told that he had pernicious anæmia. He improved under arsenic and went along for nearly a year, when he had another relapse. Again the arsenic was of service, although he was longer getting back on to his feet ; in fact he did not get entirely back this time, but kept along fairly well until in 1908 he had a very severe relapse. After about four months he got about again, and from that time, save for an attack of pneumonia in 1909, he did very well up to the early fall of 1912.

"About this time a bad relapse started, and although the old remedies that had formerly checked the progress of such an attack were faithfully used, he steadily failed, until things began to look very serious. At this time I obtained my thorium and began treatment with it. During the first three weeks I combined with it an electric treatment of the long bones and solar plexus, which had given such good results in the treatment of the case since 1908, that I was very loth to discontinue it. He continued to fail steadily, and it occurred to me that possibly the electricity was in some way rendering inert the thorium emanations, so this was stopped. At once he began to gain in a very decided manner. His condition at that time was as follows : Œdema of all the dependent parts, dyspnœa upon the slightest exertion, poor appetite and feeble digestion, and a blood count of 1,200,000 red corpuscles. In just four weeks from that time he was walking about town as vigorous as ever ; œdema entirely gone, fine appetite and digestion, and a blood count of 4,800,000 red cells. One week later the count went to 5,280,000 ; the blood picture was normal, and the patient volunteered the statement that he had not felt so well for seven years. As a test of his heart action he recently climbed a long hill, with a snowstorm in progress, without getting out of breath.

"Of course many years must elapse before we can positively say that such a case is entirely cured ; but the return to normal of the cells, in shape as well as quantity, leads me to feel very optimistic. In his case the remedy was given almost entirely by the vein, 20,000 M. units being injected into the median basilic every other day with an all-glass syringe and a 27-gauge needle. No irritation was felt. At first, a few injections were made into the muscles, but as this caused considerable soreness it was discontinued. A recent communication from Dr. Bickel advises me that in his opinion it is best to give an intravenous dose of 50,000 M. units once every four days until three have been given, and then to continue the treatment with a daily portion by the mouth of 20,000 units, one-third to be taken after each meal." (*See also under* THORIUM.)

Brieger[13] speaks highly of the use of **Pancreatin** in addition to **Arsenic** in the treatment of pernicious anæmia. He gives the arsenic in the form of Fowler's solution thrice daily after food, starting with two-drop doses and rising steadily to eight-drop doses; and he gives the pancreatin—"as much as lies on the point of a knife"—three times a day before meals. He reports 3 cases so treated; all improved rapidly for the time; 2 died later in a relapse, but 1 is still well, three years after the original treatment. He holds that the pancreatin definitely assists the arsenic in the cure, even though the latter may not be lasting.

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ANÆMIA, SPLENIC. (See SPLENOMEGALY.)

ANÆMIC SUBJECTS, OPERATIONS ON.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

Cullen[1] has published the after-results of gynæcological operations on 170 patients with a hæmoglobin percentage of 40 or less. He finds that as a rule patients with a relatively low percentage stand pelvic or abdominal operations well, but in cases of carcinoma of the uterine cervix or body the danger is increased. He regards transfusion as the best method of treating the anæmia, and says it should be performed before operation in such cases. He points out that great care is necessary in their after-treatment, especially in avoiding the use of strong purgatives.

REFERENCE.—[1]*Surg. Gyn. and Obst.* 1913, ii, 276.

ANÆSTHETICS.

J. Blumfeld, M.D.

Inhalation Anæsthesia.—The use of **Nitrous Oxide** with oxygen for major surgery has been much under discussion recently. The contention of Crile that, for avoidance of shock, nitrous oxide is far superior even to ether, is partly, no doubt, responsible for the awakened desire to use it in cases where hitherto it has been considered inefficient. The combined use of preliminary alkaloids has also widened the field within which satisfactory results may be obtained by so comparatively weak an agent. The absence of all toxic effects from its use renders it, of course, far superior, as regards immediate and remote after-effects, to the poisonous anæsthetics. It is their greater efficiency, particularly from the point of view of muscular relaxation, that has hitherto kept nitrous oxide out of the field. Some of the extreme advocates of the latter are prepared to maintain that even in the matter of muscular relaxation this agent can always be made to give all that can be required. Such, however, is not the opinion of Teter,[1] whose experience with nitrous oxide in major surgery is very large indeed. He writes: "Muscular tone is maintained to a much greater extent than when ether or chloroform is used, it being impossible to obtain the same degree of flaccidity of the musculature that can safely be procured with the more powerful anæsthetic agents."

In consequence of this, and other properties of nitrous oxide, it is, he says, necessary to utilize every known scientific principle that will enhance the efficiency of the gas in order to make it practical as an anæsthetic. These principles he states to be: (1) The use of pre-anæsthetic narcotics, (2) The use of oxygen, (3) The even flow of both nitrous oxide and oxygen, (4) Warm gases, (5) Re-breathing, (6) Positive pressure. It will readily be understood that to meet these requirements apparatus of considerable complexity and bulk is necessary, and that is, indeed, the chief practical obstacle to the method under discussion. When, however, the advantages offered are great and important, as they undoubtedly are in certain cases, the mere question of inconvenience and labour must be waived. Anæsthesia lasting one hour requires on the average 100 gallons of nitrous oxide and 20 gallons of oxygen.

Teter regards it as an established fact that all anæsthetics are safer when administered warmed. He believes, with Gwathmey, that when warm they are increased in value as regards life without a decrease in their anæsthetic effects. In forty cases, he found that if nitrous oxide was at 90° F., the induction period averaged 30 seconds; when the gas was at 42° F., the time necessary for inducing anæsthesia was 52 seconds. Many of the patients inhaling the warm gas were unconscious after two to six breaths; most of those taking the cold vapour required ten or even twenty inhalations to abolish consciousness.

As regards re-breathing, Teter founds his practice upon the principle laid down by Yandell Henderson in his well-known work upon acapnia, that carbon dioxide should never be used in greater concentration than 5 or 6 per cent. Teter regulates his re-breathing in such a way that the percentage of CO_2 is from 5 to 0·5 per cent. He has arrived at these figures by careful analysis of the contents of bags subjected to re-breathing. Positive intrapulmonary pressure may be used with nitrous oxide to the extent of 6 to 8 mm. Hg.

Teter has some interesting remarks upon the limitations of his method, and upon the necessity for using some **Ether** in order to secure the requisite relaxation. He points out that the number of times when such additional help is required, depends only partly on the anæsthetist, and partly also upon the operator. When the anæsthetist is familiar with the surgeon's methods, Teter thinks that ether is necessary in some 5 to 8 per cent of the cases; with strange surgeons the figure is more likely to be 20 to 25 per cent.

Nitrous oxide is not ideal in the case of strong vigorous patients, those addicted to drugs, or those who are highly nervous, excitable, apprehensive, or sensitive. It is in such cases as these that the use of pre-anæsthetic narcotics is of service. Still further help is to be gained, according to those who practise it, by Crile's method of combining the use of **Local Analgesics** with that of the general anæsthetic. In addition, **Morphia** and **Scopolamine** are used beforehand, and the entire process Crile describes as "*anoci-association*,"[2] meaning thereby the total exclusion of noxious influences. The method is a logical outcome of the kinetic theory of shock,[3] according to which shock is only to be prevented by the blocking off from the central nervous system of every kind of trauma, whether physical or psychical; and Crile has endeavoured to show that psychical trauma, such as emotion before operation, is morphologically represented by changes in the brain cells. The local analgesia is applied in the form of infiltrations of successive layers of tissue from the skin onwards, **Novocain** ·25 per cent and ·5 per cent of **Quinine** and **Urea Hydrochloride** being the agents employed. The latter has for its special aim the prevention of after pain.

Nitrous oxide and oxygen in major surgery has been advocated in Great Britain by several writers during the past year,[4] and from the patient's point of view there is undoubtedly often immense advantage in restricting anæsthetics to this non-poisonous agent;[5] at the same time its administration in major surgery requires more experience than that of any other anæsthetic, and fatalities occur in the hands of the unaccustomed.[6]

In an article upon the chemistry of inhalation anæsthetics, Baskerville states that nitrous oxide should contain at least 95 per cent N_2O, and no solids, liquids, combustible organic matter, chlorine, or other oxides of nitrogen. If CO_2 is present, the percentage should be known.[7]

The relation of shock to blood pressure is discussed by Bloodgood,[8] who asserts that under nitrous oxide with local analgesics the blood-pressure remains more or less uniform, and that this method of anæsthesia reduces mortality in all operations in which shock is the fatal agent.

Intratracheal Anæsthesia.—This method, originated by Meltzer, of New York, as the result of laboratory experiments, is now being extensively tried in this country. It presents obvious advantages in certain cases, those particularly which involve bleeding that may affect the air passages; for the continuous outgoing stream of air at the glottis entirely prevents the risk of aspiration of blood or any other foreign body, such as pus or mucus. It is probable that further experience will allow of simplification of the at present rather complicated apparatus required. Such simplification has to some extent taken place already, and the machines of Shipway and of Kelly (*Figs.* 3, 4) are less cumbrous than the original form devised and used by Elsberg. The practical points in the management of this method are thus described by Kelly:[9] The patient is anæsthetized in the ordinary way by ether, and must be well under. This is a very important point, for if the anæsthesia is insufficient it will be difficult to pass the tracheal tube, and trouble may be experienced owing to glottic spasm. With the head well over the end of the table a direct laryngoscope is passed. No attempt should be made to pass the catheter without seeing the glottis. To try to pass it blindly through an introducer is less satisfactory than the simple procedure under direct vision. The tracheal catheter used is the ordinary conical with two side openings. The head of the instrument is very useful in directing it into the glottis. It is passed down to the bifurcation, i.e., about 26 cm. from the incisor teeth. The current of air is now directed into the catheter. At first

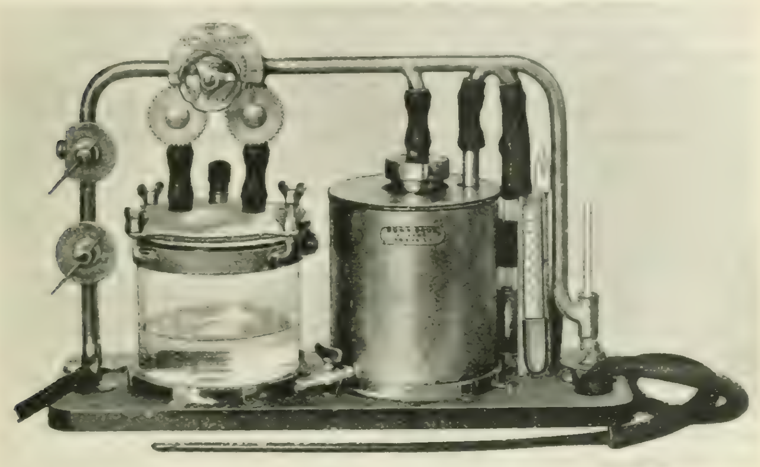

Fig. 3.—Kelly's apparatus for intratracheal anæsthesia. The modified apparatus.

there is some spasm of the glottis, and the pressure inside the trachea is raised by expiratory efforts. This is shown by the fact that the safety

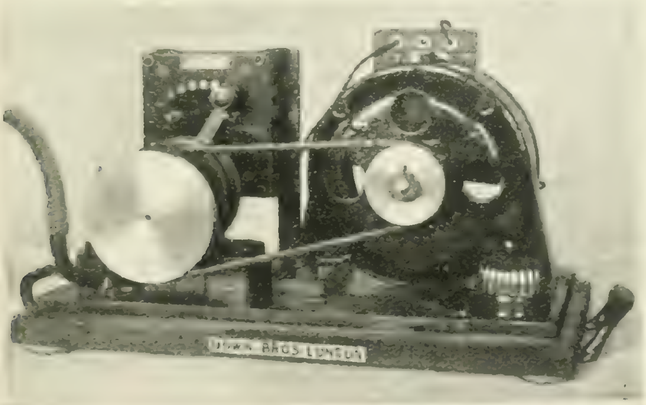

Fig. 4.—Kelly's apparatus for intratracheal anæsthesia. The motor and blower.

valve begins to bubble. Full ether is now turned on, and the current interrupted by opening the third tap every few seconds. The spasm will soon pass off. The percentage of ether is now lessened and the pressure lowered, until the patient passes into a state of regular but feeble respiratory movements. An average pressure of 20 mm. Hg will suffice for all general surgical work with the chest unopened. For the remainder of the anæsthesia one has merely to vary the percentage of ether according to the patient's condition, and occasionally to interrupt the current and allow the pressure to fall to zero. After the operation is over, pure air is passed for a few minutes and the tube taken out before the current of air is turned off.

Cotton and Boothby[10] furnish a full account of the physiological principles on which this method is based, and also describe the use of nitrous oxide and oxygen in this procedure. They conclude that the method should be chosen for all intrathoracic surgery and in extensive operations about the head, neck, and mouth, and that a safety valve, by means of which the intrathoracic pressure cannot exceed 15 mm. Hg should always be part of the apparatus. They also make the statement which, if borne out, will have great effect in simplifying apparatus, that warming is not necessary; given a large ether chamber and 3 ft. of rubber tubing leading from it, then the ether-laden air will be about the room temperature by the time it reaches the lungs.

Anæsthesia by *pharyngeal insufflation* is recommended by [illegible][11] and his apparatus, a variation of Junker's familiar instrument, is described. The warmth of the vapour and its perfectly continuous administration are the points of advantage claimed over the ordinary method, as well as the removal of the anæsthetist's hands from the field of operation in head and neck cases.

Chloroform.—A valuable contribution to the elucidation of *death during chloroform anæsthesia* is made by Goodman Levy,[12] who shows reason to believe that ventricular fibrillation is the essential cause of chloroform death, and adduces arguments to show that intermittent administration and too light an anæsthesia are common causes of tachycardia, which may be the prelude to irrecoverable fibrillation of ventricles. The same author has described the danger of the association of light chloroform anæsthesia with adrenalin injection, and a clinical example of this fatal combination is recorded by Dupree.[13] Levy's general conclusions[14] are that the mammalian heart, when under the influence of chloroform, is in an "irritable" condition. This irritability is raised under conditions of light anæsthesia and lowered under deep anæsthesia. Abnormal ventricular beats are evoked in a heart under chloroform by conditions which stimulate it, or by equivalent conditions which remove or reduce depressing influences. Under conditions of light chloroform anæsthesia the ventricular irregularities arising from cardiac stimulation may terminate in ventricular fibrillation and death. Stimulation of the heart may be effected: (1) As a reflex from sensory excitation; (2) As a result of an intermittent administration of the anæsthetic; (3) As a result of the state of nervous excitement accompanied by struggling induced by chloroform in the earlier stages of its administration. Ventricular fibrillation is a cause of death under chloroform, probably the only cause of any moment. It can be prevented by steadily maintaining a full degree of anæsthesia.

Dudley Buxton[14] gives a full account of the *dosimetric method* of administering chloroform, describing its principles and the way in which these are put into practice.

The secretion or inactivity of the *lacrymal gland* has not been taken into account hitherto as an indication of lightness or depth of anæsthesia. The value of the observation of the tear-drops in the eye from this point of view is discussed by Rutherford.[15] He maintains that in the third stage the lacrymal secretion ceases at the same time that the earliest reflexes disappear, and that this cessation usually precedes the abolition of the corneal reflex by a very short interval. When the "canthal" tear is present, the corneal reflex should be obtainable, and the amount of the anæsthetic is as much as is compatible with successful anæsthesia.

In an article[16] upon the danger and prevention of severe *cardiac strain* during anæsthesia, the authors comment upon, and give instances of, the possible harm of the Trendelenberg position in certain cases. They find that any failure of respiration is made much more dangerous by the head-down position, and give cases and experiments bearing upon their opinion.

At the British Medical Association meeting,[17] the question was discussed of the desirability of anæsthetists examining their patients beforehand. A consensus of opinion expressed by various speakers showed the advantage of such a proceeding and the disadvantages to the patient of its omission.

Intravenous anæsthesia seems to be establishing itself as a valuable method for certain selected cases. Ether alone does not appear always to be effective, unless in dangerously strong solution, and cases are reported[18] of its use in combination with **Paraldehyde** and **Isopral.** No large amount of experience with these drugs is as yet available from which to draw conclusions. The intravenous employment of **Hedonal** in the case of children is well discussed by Barrington-Ward,[19] who regards the method as equal in immediate danger with the giving of chloroform, but unsurpassed in its freedom from various after-effects. The whole question of hedonal anæsthesia was ventilated in a discussion at the Medical Society of London,[20] as well as at the Anæsthetic Section of the Royal Society of Medicine.[20]

Anæsthesia paralysis, which is always an example of pressure palsy, is the subject of a paper by Molinari.[21] The positions, and the kind of patient, in whom it is most likely to be brought about, are arrived at from a considerable series of cases.

Spinal analgesia continues to be favourably reported upon by those who use it largely. Major Houghton[22] reports 400 cases without any case of failure to anæsthetize, or of consequences causing anxiety. Bambridge[23] writes on a basis of 1065 cases, in which there was one death, one case of partial paralysis with complete recovery, and one case of failure. He had two cases with **Alypin,** in which there was considerable respiratory depression, and one case of idiosyncrasy in which after several attempts by spinal and local injection, the analgesia was almost *nil*. Freeman Allen[24] reports improved results with increased experience. A variety of this method, "*extradural anæsthesia*," is described in a preliminary report by Lynch.[25] It has very strictly limited application. Nicolich[26] prefers spinal analgesia to all other methods for urino-genitary operations; the maximum dose of **Stovaine** that he uses is 5 cgrams for operations upon the kidney, 3 cgrams for operation upon the bladder and prostate.

Schlempert[27] describes *sacral anæsthesia*, i.e., a combination of extradural anæsthesia with preliminary "Dämmerschlaf" (hypodermic injection of narcotic alkaloids), as used at the Freiburg Frauenklinik. Here it is preferred for all cases except short operations, and for those upon women who have defects of the vascular system or who are very fat.

Local and Regional Anæsthesia.—The various forms of local analgesia by infiltration, by endo- and peri-neural injection, and by venous infiltration, have a wide field of usefulness.[28] The fact that their use involves a considerable expenditure of extra time accounts probably for the comparatively few occasions on which surgeons avail themselves of them. Their use in the reduction of fractures and dislocations is drawn attention to by Braun, who has made so extensive a study of local anæsthesia of all kinds.[29] Harris[30] of Chicago contributes an article upon nerve-blocking, or, as it is more often called, regional anæsthesia, in which he lays special stress upon its advantage from the point of view of shock prevention; and from Bier's clinic comes an account of direct anæsthesia of the smaller cutaneous veins in operations on the hands and feet.[31] Difficulty in swallowing, and trismus following upon mandibular local analgesia, are alluded to in another German contribution.[32] Felix Rood[33] gives an excellent and practical account of regional analgesia, and in the same journal will be found an account of supraclavicular anæsthetization of the brachial plexus.

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ANEURYSM, INTRATHORACIC. *Carey Coombs, M.D., M.R.C.P.*

De Havilland Hall's Lumleian Lectures[1] summarize for us the modern attitude towards this malady. Some of his chief points follow.

ETIOLOGY.—Two factors are necessary: arterial disease and overstrain. To the first syphilis contributes chiefly; Winternitz's[2] histological observations led him to attribute this not so much to medial fibrosis, as to gummatous softening of the adventitia, a view which furnishes additional reason for active antisyphilitic treatment of aortic aneurysm. That overstrain is important is proved by the greater incidence of aneurysm in males, in the decades of stress (35–55), and in districts where heavy physical strain is the common lot.

Dissecting aneurysm is ascribed by Shennan and Pirie[3] to primary medial degeneration, with splitting of its elastic fibres, bulging of the intima into the gap thus produced, and rupture of the blood-current through the latter into the media, which is split up longitudinally.

Symptoms.—Hall treats of these under seven headings. *Pain* may be anginal, neuralgic, or due to pressure; even large, eroding aneurysms may, however, cause no pain at all. *Respiratory* symptoms include two varieties of dyspnœa: the paroxysms referred by this writer to compression of the recurrent laryngeal nerves or the vagi, and steadily increasing shortness of breath arising from gradual compression of the pulmonary tissues. Pressure on the trachea and pleural effusion are other occasional causes of the dyspnœa, which in the former case may be paroxysmal and associated with inspiratory-expiratory stridor. A hard brassy cough is of the utmost importance in suggesting the possible existence of aneurysm. Hæmoptysis may occur early; it is sometimes due to a direct leakage into the tubes, sometimes to pressure on the substance of the lung, sometimes to the passive hyperæmia of cardiac disease. Hampeln,[4] writing at length in regard to the hæmoptysis of aneurysm, points out that bleeding of the sac into the air-passages may be gradual or sudden; that gradual hæmorrhage often foreshadows a sudden outburst; and that this prodromal leakage lasts longer if it is the lung itself that is implicated, while it is briefer in ulcerations into the trachea or bronchi.

Laryngeal symptoms are very common. Hall's private case-books furnished twenty-two examples of recurrent laryngeal palsy in thirty-five patients with aortic aneurysm, nineteen of the left cord only, two of the right, one bilateral. This sign is of value, since it locates the aneurysm in the transverse or descending part of the arch. *Cardiac* symptoms, apart from those of angina, aortic incompetence (if this coincide with the aneurysm), and intrapericardial rupture, are singularly inconspicuous. *Dysphagia* due to œsophageal compression is of importance, since if this cause of the symptom be forgotten, an œsophageal bougie may be passed, with disastrous effect. Hall thinks dysphagia may sometimes be caused by reflex spasm of the pharynx. *Paraplegia* is an occasional consequence of vertebral erosion. Among *general* symptoms he mentions wasting, and an attitude which he thinks characteristic: the man sits up in bed with the knees drawn up, arms forward, shoulders slightly raised, and the head bent forward.

Diagnosis.—Hall insists on the importance of an exhaustive physical examination, and alludes in particular to some of the pressure signs. Comparison of the radial pulses may show complete absence of one of them, inequality as detected by the finger or the sphygmomanometer, difference in the character of the sphygmograms, or delay in pulse at one or other wrist. The inequalities are apt to become more definite if the patient be told first to inspire deeply and then to expire fully and slowly. Mackinnon's[5] systematic measurements prove that in aneurysm the blood-pressure is usually about normal; that in 65 per cent there is asymmetry, and that in 30 per cent the difference between the pressure on the two sides is so marked as to be of diagnostic value.

Hall speaks in the highest terms of the value of *skiagraphy* in diagnosis. He points out that every patient suspected of harbouring an aneurysm within his chest should be examined from behind and from before, as well as in the right anterior oblique position, with the fluorescent screen. The only aneurysm that can elude detection by this means is the small sac within the concavity of the arch. The method is not only valuable in the early detection of the presence of aneurysm but also in proving its absence in suspicious cases.

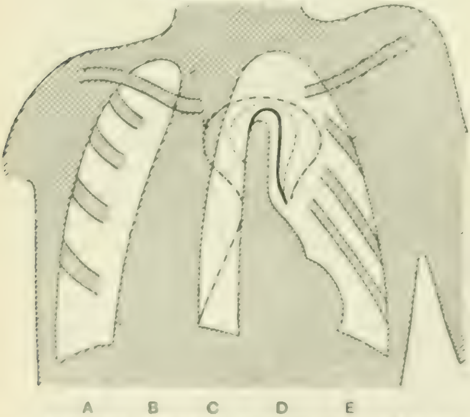

Fig. 5.—A, [illegible] B, [illegible] C, [illegible] D, [illegible] E, [illegible] ——— [illegible] - - - - - [illegible]

Letulle[6] adds a word of caution founded on experience of a case which he relates, to the effect that the absence of pulsation in an intrathoracic shadow does not necessarily prove that it is not due to an aneurysm, for if the sac be filled with solidified clot it may fail to pulsate visibly on the fluorescent screen, and may for that reason be mistaken for a new growth. *Fig.* 5 shows diagrammatically what is seen with the screen when the patient is examined in the right anterior oblique position.

Laryngeal pulse is of great importance in diagnosis, but it may also be produced by the pressure of the dilated left auricle in mitral stenosis and by new growth.

Course.—Hall's figures indicate that "the duration of life after the recognition of an intrathoracic aneurysm is usually limited to less than four years, though in very exceptional cases life may be prolonged for six or seven years." Cases are on record of fifteen years' duration from onset of symptoms. Rupture terminates about 40 per cent of the cases, and is particularly frequent in aneurysms arising from the transverse and descending portions. It occurs most often into the left pleural cavity. Cardiac failure, cerebral embolism, pulmonary disease, and intercurrent infections, are other modes of terminations.

TREATMENT.—J. A. C. Macewen[7] records a case which he describes as one of aortic aneurysm (though the clinical evidence forming a basis for this diagnosis is not stated fully), in which he introduced a needle into the aorta on several occasions, scratched its posterior wall, and thereby produced a deposit of white clot, with marked amelioration of symptoms. This plan, introduced by Sir William Macewen in 1890, has not been applied in many instances, but its results have been so far encouraging as to warrant a further trial, which is more than can be said for the other surgical devices which have been employed.

Of non-surgical plans Hall lays most stress on the method originated by Tufnell, whose instructions ran as follows: "Place the patient at once upon the minimum diet, and forbid even the slightest movement which can be avoided. The room in which he lies must be as quiet and secluded as possible. No treatment by drugs is to be attempted at the same time. Listen to no complaints of thirst so long as the pulse and temperature are normal, or nearly so, and the whole allowance of solid food is consumed. The diet, under ordinary circumstances, must be confined to three meals served at regular intervals, and restricted to the following in kind and amount—viz.: For breakfast, 2 oz. of white bread and butter, with 2 oz. of cocoa or milk. For dinner, 3 oz. of broiled or boiled meat, with 3 oz. of potatoes or bread, and 4 oz. of water or light claret. For supper, 2 oz. of bread and butter, and 2 oz. of milk or tea, making in the aggregate 10 oz. of solid and 8 oz. of fluid food in the twenty-four hours, *and no more*. In some irritable constitutions this restriction in diet will be irksome, and the patient becomes intolerant and restless. Here, instead of attempting to persist in the withholding of food, the appetite should be indulged *to the satisfying of the patient* (so as to keep him tranquil), *but no more*." Hall adds that in practice it will be found almost always necessary to increase the fluid to 12 or even 16 oz. in the twenty-four hours; usually 12 oz. of solids are sufficient to satisfy the patient.

For this treatment patients must be carefully selected; it is useless for those whose temperament makes the necessary absolute rest impossible, also for such as have to return to laborious tasks afterwards. Alcoholics and persons with aortic incompetence are also disqualified. The "aneurysm of physical signs" arising from the ascending aorta is more suitable than that springing from the transverse arch. Symptoms which call for treatment are pain (**Morphine**), constipation (**Cascara, Pil. Coloc. c. Hyoscy,** or **Enemata of Glycerin** and **Olive Oil**), and sleeplessness (**Chloral** or **Chloralamide,** with or without **Bromide**). The patient should be allowed to return to a normal posture and more liberal diet by very slow degrees.

The use of large doses of **Potassium Iodide** is of indubitable value in aneurysm; unfortunately, however, it cannot be applied to those receiving the Tufnell treatment, because of the thirst produced by the drug. Its usefulness is probably due to the fact that aneurysm is so often an effect of tertiary syphilis (*vide supra*); salvarsan however is contraindicated in cases of aneurysm. The patient taking iodide may be restricted as to exercise, though not closely limited in diet. Doses above 20 gr. are not necessary and they may do harm.

Hall is not optimistic as to the curative value of the treatment fathered by Lancereaux of Paris, consisting of intramuscular injections of **Gelatin** in saline solution. It involves certain risks, and does not effect a cure.

REFERENCES.—[1]*Lancet*, 1913, i, 804, 869, and 945; [2]*Johns Hop. Hosp. Bull.* 1913, 212; [3]*Brit. Med. Jour.* 1913, ii, 1287; [4]*Deut. med. Woch.* 1913, 841; [5]*Brit. Med. Jour.* 1913, ii, 869; [6]*Presse Méd.* 1913, 214; [7]*Ann. Surg.* 1912, ii, 699.

ANEURYSMS, SURGERY OF. (*See also* ANEURYSM, INTRATHORACIC, *and* ARTERIES, SURGERY OF.)

Priestley Leech, M.D., F.R.C.S.

Aneurysm of the Superficial Palmar Arch.—Regnault and Bourrat Lacouture[1] report a case of this disease caused by repeated contusions. The patient was an artilleryman who had been in the habit of striking the breech of a cannon with the palm of his hand. The aneurysm was treated by ligature of the artery at each end of the sac. The authors recommend excision as the best method of treatment. As a rule, these aneurysms arise from a wound of the vessels from a knife or other sharp instrument.

Aneurysm of Abdominal Aorta.—Collins and Erastus Hartwell[2] publish a case of abdominal aorta treated by means of Colt's apparatus. The diagnosis was difficult: the man had been sent into hospital as a case of acute appendicitis. Laparotomy revealed an aneurysm springing from the aorta below the origin of the renal artery, and extending as far as the bifurcation of the aorta. Colt's trocar was thrust in, and a cap packing of 120 inches of wire was passed into the tumour. The patient died six days later. The authors say the wire did not form a cage as it was supposed to do, and the kind used was too stout.

Subclavian and Innominate Aneurysm.—Lothrop[3] of Boston, U.S.A., reports a case of bilateral subclavian aneurysm. Out of a series of 120 subclavian aneurysms in only two instances were the lesions bilateral. The patient was a man, 40 years old, who had contracted syphilis twenty-five years previously. The aneurysm of the left subclavian was excised, and four years later the patient returned with an aneurysm of the right subclavian, and in this case the artery was tied at either end of the sac, which was opened, cleared of clot, and obliterated after the method of Matas. Convalescence was uneventful.

Inoui[4] of Osaka reports a case of aneurysm of the innominate artery successfully treated by extirpation. The patient had previously had a popliteal aneurysm extirpated. Inoui thinks that this method of treatment is to be recommended in the early stages and where the vessel wall is not too much diseased.

Aneurysm of the Internal Iliac Artery.—MacLaren[5] reports a case in a woman, aged 18, which came on soon after a severe confinement. Matas, in "Keen's Surgery," reports several thousand cases of aneurysm, but not one of the internal iliac artery; Ericson, in a large number, only reports a single case. MacLaren operated, as it was increasing in size. He made a Pfannenstiel (transverse) incision with the idea of reaching the deep pelvis more easily, but was disappointed, as he could not see a small portion of the sac. He followed the common iliac artery to its point of division, and the posterior iliac was tied by the sense of touch with heavy catgut. When the ligature was tightened, pulsation in the tumour entirely disappeared. A year and a half later the tumour was much harder, with very slight pulsation.

Occlusion of Abdominal and Thoracic Aorta.—Halsted,[6] of Baltimore, reports some experiments on occlusion of arteries by bands of fresh aorta and fascia lata. He had previously applied aluminium bands to the human aorta four times with promising results; but experimental work on animals led him to expect that ultimately the metal bands would cut through the artery. These fears were well founded; an old woman to whose abdominal aorta a metal band was applied, with cure of her aneurysm, was seized with pain at the end of six weeks after leaving the hospital, returned to bed, and died next morning from hæmorrhage, the aorta having ruptured at the site of the band. He has used cuffs and spiral strips of the fresh aorta of a dog wound about the aorta of another dog. The spiral strips are safer than the cuffs, as in two instances of the application of the latter, the mattress sutures taken to hold its flaps together cut part way through, and being thus brought in contact with the aortic wall, wore a minute hole in the vessel through which the animal bled to death. To each end of the band of fresh tissue a narrow tape is sewn, to facilitate the manipulation of the transplant, which is wound twice about the aorta. When one or two stitches have been taken at one end to hold the contiguous edges of the spiral together at this point, the other end of the strip is pulled upon until the aorta is occluded to a little more than the desired amount, and then two additional stitches are taken to maintain the constriction. In some cases there has been absorption of the band, and the lumen of the aorta has been restored. If, however, the constriction can be maintained for two months, or even one, it might effect cure of an aneurysm; and if not, a totally occluding ligature might be applied after such a lapse of time without great risk, and possibly the aneurysm might in some cases be excised. The desirability of transplanting a segment of vessel, when feasible, must always be borne in mind. Francesco Nassetti,[7] of Siena, antedated Halsted's experiments by fifty-six days, as he applied a band of fascia about the carotid artery, and hence the credit of the idea belongs to him.

REFERENCES.—[1]*Rev. de Chir.* 1913, 337; [2]*Brit. Med. Jour.* 1913, i, May 10; [3]*Bost. Med. and Surg. Jour.* 1913, i, 35; [4]*Deut. med. Woch.* 1913, 1147; [5]*Ann. Surg.* 1913, ii, 269; [6]*Johns Hop. Hosp. Bull.* 1912, 217, *Ann. Surg.* 1913, ii, 183; [7]*Atti della R. Acad. dei Fisiocrit. di Siena*, 1912, April 26.

ANGINA PECTORIS.

Carey Coombs, M.D., M.R.C.P.

Fiessinger,[1] studying eighty cases, thinks the coronary factor in the causation of angina has received too much attention. He divides the causes into coronary disease, aortic and myocardial disease, nephritic hypertension, aerophagy, and obesity. Angina according to this writer is a "neuralgia of the periaortic fibres." Prolonged rest in bed is essential in most cases. A system of **Small Meals** of one course only, repeated every two hours, making seven such meals during the day, is of much benefit. Roast poultry, fish, or ham may be given once daily when the excretory action of the kidneys is satisfactory, and after each meal, if solid in character, a claret glassful of hot water should be taken.

Coronary angina being often syphilitic, may demand **Specific** treatment; the Wassermann reaction may be called upon to decide this. **Theobromine** and **Trinitrin** are also useful. In the angina of *aortic insufficiency* syphilitic infection and coronary disease are often partly responsible. Moderate doses of **Potassium Iodide** are called for in such, often with rest in bed up to two months. If associated with *myocardial disease* the angina may be relieved by combining **Digitalin** with **Theobromine.** Patients of this class often need rest in bed for a month, as much to soothe an excitable nervous system as to refresh the heart. In *hypertensive* angina relief may come spontaneously from dilatation of the auricle under over-stress; when this occurs the pains are likely to be mitigated. In hypertensive cases where this relief does not occur, a **Lacto-vegetarian Dietary** on the system of frequent small meals may be given, while frequent **Laxatives** are desirable. Theobromine and digitalin assure some amelioration of the symptoms. In cases of *obesity* and *aerophagy* a cure is the rule. Here the system of dietary already referred to is of the utmost advantage. The loss of weight and flesh in these cases has marvellous results. The use of theobromine twice daily for a month assures the cure. These patients, however, ought to be warned against undergoing any fatigue. In the cases of aerophagy the painful crises are generally evoked by walking. Dyspeptic states are usually the starting point, and a cachet of **Sodium Bicarbonate** along with some absorbent powder after each meal is of benefit. Trinitrin and theobromine are useless and even harmful. The most usual type of gastric trouble in these cases is a state of gastric hyperæsthesia, with hyperchlorhydria, pyloric spasm, and secondary fermentation.

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[1] Fiessinger, *Bull. de l'Acad. de Méd.* 1912, 164 (*Brit. Med. Jour. Epit.* 1912, ii. 64).

ANKYLOSTOMIASIS. (See UNCINARIASIS.)

ANTHRAX.

(*Vet. Jour.* 1912, i. 119.)—French, after considering the various modes of treatment in vogue, concludes: "Although some cases may get well without more than conservative antiseptic treatment locally, and although some are benefited by such remedies as pilocarpine or salvarsan, the surest treatment known to save life in commencing cases, and in which, therefore, most trust can be placed, is **Sclavo's Anti-anthrax Serum**."

ANOCI-ASSOCIATION. (*See* ANÆSTHETICS.)

ANUS, DISEASES OF.

Sir Charles Bent Ball, Bart., M.Ch., F.R.C.S.

Cancer.—G. H. Makins[1] records a remarkable case of the combination of columnar carcinoma and scaly epithelial carcinoma at the anus. The patient, a man aged 72, came under observation in April, 1909, with a sore at the anus which had been present some months. On examination, a smooth circular ulcer was seen, involving the back and left margin of the anus. The ulcer was three inches in diameter, and raised above the surface but there was no induration of the margins or base of the area affected; it extended within the anal canal, but the rectum above it was normal.

It was dissected away and a microscopical examination made, which showed it to be a squamous epithelioma, apparently invading a columnar carcinoma. Nineteen months after operation the patient was again seen; a nodular flat tumour occupied the region of the scar; it was covered with epithelium and not ulcerated; no extension into the rectum could be made out; it was freely movable, and the inguinal glands did not appear to be enlarged. The patient refused further operation, and died of extension of the disease in April, 1913.

Pruritus.—At a meeting of the American Proctologic Society, D. H. Murray[2] made a further communication on the cause of pruritus ani, and the results of treatment. He considers the chronic inflammation of the skin surrounding the anus, which so frequently spreads to the scrotum in the male and to the vulva in the female, to be due to a streptococcic infection in a large proportion of cases. In twenty out of twenty-five cases, the streptococcus was demonstrated by cultivation. In some cases, as many as seven separate cultures were made before the organism was found and isolated. The streptococcus is usually found in small chains (four to seven elements). He treats cases in which this organism has been isolated by an autogenous **Vaccine,** made of a uniform strength of 1000 millions per c.c.; his initial dose is usually 130 millions, but in the later injections this is largely increased.

REFERENCES.—[1] *Brit. Jour. of Surg.* 1913, i. 332; [2] *Trans. Amer. Proctol. Soc.* 1913, 112.

APPENDICITIS.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

DIAGNOSIS.—A frequent criticism of the early operation in appendicitis is the possibility of errors in diagnosis. Recognizing that early operation is the safest method of treatment, de Quervain[1] examined the records of 1723 cases of appendicitis operated upon by various Swiss surgeons, with the object of finding the proportion of cases in which errors were made, and to discover whether these diagnostic mistakes could be justly considered a drawback to early intervention. Among the 1723 patients there were 94 (5½ per cent) which proved at the operation not to be suffering from appendicitis. In 10, a perforated gastric or duodenal ulcer was found; in 2 intestinal perforations in the ileo-cæcal region; in 2 intestinal obstruction; 1 had acute pancreatitis, and 1 an acute mesenteric thrombosis. Pneumococcal peritonitis was mistaken for appendicitis in 5 cases, cholecystitis in 3, and renal calculus in 1.

Pelvic affections in women are particularly apt to be diagnosed as appendicitis; thus there were 9 cases of acute salpingitis, 6 of tubal abortion or ruptured tubal pregnancy, 1 case of torsion of the ovary, and 14 of twisted or ruptured ovarian cysts. Pneumonia led to errors in diagnosis 7 times; there were also 3 cases of typhoid, 1 of scarlet fever, and 1 of acute nephritis submitted to operation.

In a certain proportion of these cases where mistakes were made, the operation was needed at least as urgently as if it were appendicitis. In a fifth of the cases operative treatment, while not urgent, was beneficial. In the remainder, operation was not necessary, but could rarely be proved to be the cause of death.

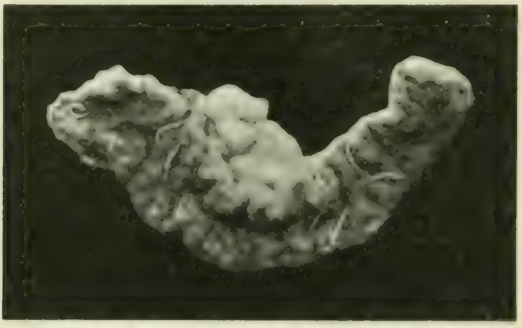

Fig. [illegible].—Chronic appendicitis due to thread-worms.

Complications.—Cheever[2] points out that the most frequent complication of acute appendicitis is *post-operative intestinal stasis*. This is generally due to paralysis of the bowel wall consequent upon the peritoneal infection; there are other cases, however, in which the obstruction is caused by a mechanical twist or kink, most frequently affecting the terminal ileum. Many of the former group recover spontaneously, or are relieved by suitable non-operative treatment; obstruction from mechanical causes, however, needs early operative treatment if the patient is to recover, and it is therefore of the greatest possible importance to recognize these cases. Cheever thinks that a certain number of cases of this latter group are due to adhesion of the ileum to the inflamed bed of the appendix on the lateral pelvic wall, a condition to be suspected if, after a few days of normal convalescence, symptoms of intestinal stasis appear in a patient whose inflamed appendix has been stripped away from the side wall of the pelvis.

A recently recorded series of cases of *intestinal parasites in the appendix*[3] seems to support von Moty's suggestion that different varieties of parasites may give rise to different lesions in the appendix; the thread-worm (*Fig.* 6) and trichocephalus causing a chronic inflammation, while the round-worm may lead to a more acute attack, possibly ending in gangrene. Of ten cases in which thread-worms were found, only two were acute; three only of the cases were in children, one of them being acute. The single cases of round-worm and *Trichocephalus dispar* in the appendix were both chronic. The latter is also of interest from the fact that the appendix was the seat of a primary carcinoma.

References.—[1] *Jour. de Chir.* 1913, 384; [2] *Bost. Med. and Surg. Jour.* 1913, i, 710; [3] *Edin. Med. Jour.* 1913, i, 437.

APPENDICITIS, CHRONIC.

Robert Hutchison, M.D., F.R.C.P.

Diagnosis.—Bassler[1] is of opinion that one is not justified in diagnosing chronic appendicitis unless the appendix is tender. In order to elicit tenderness, he recommends that one should try to compress the appendix against the iliacus muscle by pressing at a point where the outer border of the right rectus muscle crosses a line drawn from the umbilicus to the anterior superior iliac spine. He proceeds as follows: Standing at the right and facing the patient (for right-handed individuals) the thumb is placed vertically on the abdomen, the tip pointing to the ensiform, when it is slowly pressed backward into the abdomen, not inward, outward, up, or down. When the thumb has been sunk about half-way down to the back of the abdominal cavity, it is swung to the right of the patient at a right angle to the downward pressure line. This pinches the appendix against the iliacus muscle and unyielding structures under and at the side of it, and usually elicits pain or tenderness. It is well, having done this in the mid-distance between the anterior superior spine and the umbilicus, and not having obtained tenderness, to move the thumb down about one-half inch, performing it again, and so on downward until one has reached almost to the brim of the pelvis. The same procedure on the left side serves as a control. By means of this method of downward and then right lateral pressure it is possible to elicit tenderness in the average case of chronic appendicitis.

Aaron[2] attaches importance, in the diagnosis of chronic appendicitis, to referred pain or distress in the epigastrium, left hypochondrium umbilical, left inguinal, or precordial regions, when continuous firm pressure is made over McBurney's point.

Reder[3] employs *rectal* palpation in the diagnosis of obscure cases. In such, there is a point of tenderness on the right side of the rectum just above the circular ring of muscular fibre which forms what is sometimes known as the valve of O'Beirne. In making the examination, the patient is comfortably placed upon his back on the examining table, with both legs flexed. The index finger, well lubricated, is introduced into the rectum, and a search made for O'Beirne's valve. This valve is sometimes reached with some difficulty, especially when located high, or when the examining finger is rather short. It is absolutely necessary that the valve be located. Its recognition is readily perceived, the sensation imparted being very similar to that which the examining finger experiences when introduced into the os uteri during the first stage of labour.

The valve having been located, the finger is hooked into it and gentle traction made upon the structures to test the mobility of that portion of the rectum. The tip of the finger is allowed to rest within the lumen of the valve, and the patient asked if he experiences any pain. The answer is usually "No." Should there be any, it is generally referred to the sphincter area of the rectum. By allowing the finger to rest for a short time this pain will subside. After being assured by the patient of the total absence of pain, the tip of the finger is gently pushed upward toward the right iliac fossa, when, in the event of a lesion of the appendix, the finger will touch a point beyond the valve that causes the patient great pain. As a control manœuvre, a similar point might be touched by sweeping the examining finger toward the left inguinal fossa, usually with negative results.

Hertz[4] speaks highly of the value of *Bastedo's sign*, which he describes as follows: "The test depends upon the production of pain and tenderness in the right iliac fossa on inflation of the colon with air. For this purpose I use an ordinary rubber rectal flatus tube, which is connected by a short piece of glass to a pump such as that used with the sigmoidoscope. Bastedo recommends that the tube should be inserted 11 or 12 in. into the rectum, but there is no advantage in introducing it further than just within the ampulla of the rectum—about an inch and a half from the anus. After the tube has been inserted, the patient lies flat on his back, and the pump is brought up between his legs. On now slowly pumping air through the tube, the colon is seen gradually to distend; and after a certain quantity has been introduced an individual who is not suffering from appendicitis feels a diffuse discomfort in the lower part of the abdomen, but there is no pain unless an excessive quantity of air is introduced, in which case it is not marked on one side more than the other. There is also no tenderness. Patients suffering from appendicitis, however, generally experience pain in the right iliac fossa, even if the pain has hitherto been confined to the epigastrium or the neighbourhood of the umbilicus. Whenever pain is produced, and in some cases in which none has been felt, well-marked tenderness is found in the neighbourhood of McBurney's point. When tenderness has already been observed in this situation, it is always much increased by inflation, but it is also found in cases in which no tenderness has hitherto been noticed in spite of frequent examinations. In a number of instances I have observed a further exceedingly characteristic symptom: the pain is referred to the epigastrium when pressure is exerted on the right iliac fossa after inflation, the epigastric pain being identical in character with that which formed the chief symptom of which the patient complained."

REFERENCES.—[1] *Amer. Jour. Med. Sci.* 1913, ii, 204; [2] *Jour. Amer. Med. Assoc.* 1913, i, 350; [3] *Surg. Gyn. and Obst.* 1913, i, 291; [4] *Lancet*, 1913, i, 816.

ARSENICAL CANCER.

F. Graham Little, M.D., F.R.C.P.

Nutt, Beattie, and Pye Smith[1] review 31 cases, one of them a new observation. In nearly all of these, arsenic had been taken for many years; in nearly all, hyperkeratosis was present, especially of the palm and soles; in fully half, the cancerous lesions were multiple; in a fourth of the cases, the age of the patients was below thirty-five years. The epitheliomatous process usually started with a keratosis, on the upper extremity in nearly two thirds. Excision of the cancerous lesion or amputation of the affected part was practised in two-thirds, in many cases with subsequent local recurrence; in about a fourth of the cases metastasis in internal tissues was the termination. Three times as many men as women were affected. The presence of arsenic in the tissues seems to have something of the effect of old age in weakening the resistance to cancer; frequently repeated slight injury determines the incidence of the disease.

TREATMENT.—On the first indication of the earliest epitheliomatous change, viz., keratosis, the drug should be withdrawn, if it is being taken. Local conditions, e.g., warts, may be best treated by **Freezing** with **Carbon Dioxide.** Where there are fissures or ulcers which prove intractable to treatment for more than a month, **Erasion** and **Skin Grafting** are recommended. When epithelioma is diagnosed, free **Excision** or even **Amputation** of the part, e.g., a finger or hand, should be practised.

REFERENCE.—[1] *Lancet*, 1913, July and August.

ARTERIES, SURGERY OF. (*See also* ANEURYSMS, SURGERY OF.)

Priestley Leech, M.D., F.R.C.S.

Arterio-venous Anastomoses.—Bernheim,[1] of Baltimore, reports an extraordinary case of reversal of the blood current in all four extremities. The patient was a young woman, 26 years of age, in whom arteriovenous anastomosis was performed in the left and then in the right leg[2] for Raynaud's disease in 1911. In 1912 the same condition—pain, actual and threatened gangrene—necessitated reversal of the circulation in both arms; this was done in the left arm on January 22, 1912, and in the right on March 5, 1912. Operation was successful in each instance, the brachial artery and vein being united by lateral anastomosis. During the course of operation the only apparent abnormality noted was the rather small size of the artery and the severity of its contraction on the slightest manipulation. The technique was as follows: both vein and artery were incised at right angles to the direction of the blood-stream; the lips of the wound thus spring apart and tend to remain so. The vessels were united with a single continuous thread, and the vein was tied off securely above, proximal to the site of anastomosis.

Bernheim thinks that Coenen's views[3] as to the impossibility of the procedure on physiological grounds are not sound, and that judgment ought to be reserved until enough operations have been done by surgeons specially skilled in vascular work, to justify a really unbiassed analysis. This method of side-to-side anastomosis is simpler than the end-to-end, and causes far less risk to the patient in case of failure. Bernheim's patient has benefited very much in her left leg and both arms, but still has pain at times in her right leg.

Vascular Anastomosis.—Porta, of Siena,[4] describes the following method of end-to-end suture of blood-vessels. The only objections seem to be that it is not applicable to very small vessels, and it reduces the length of the arteries; but as a rule this latter is not a serious matter. On the other hand, it does not reduce the diameter of the vessel, it affords a wide coaptation of the vessel endothelium, and reduces to a minimum the number of threads projecting into the lumen. At each of the ends of the divided vessel four flaps are cut (*Fig. 7, a*), of the same size, and a few millimetres long. At the middle of the base of one flap a loop of silk is passed from without inwards, and then from within outwards through the corresponding flap of the other end of the vessel (*Fig. 7, b, c*). The loop is divided, and the threads are tied on either side (*Fig. 7, d*). The same manœuvre is repeated with the other flaps. If, after suturing them all, a few drops of blood escape at the corners, a suture may be passed penetrating the external coats of the vessel only and not the endothelium.

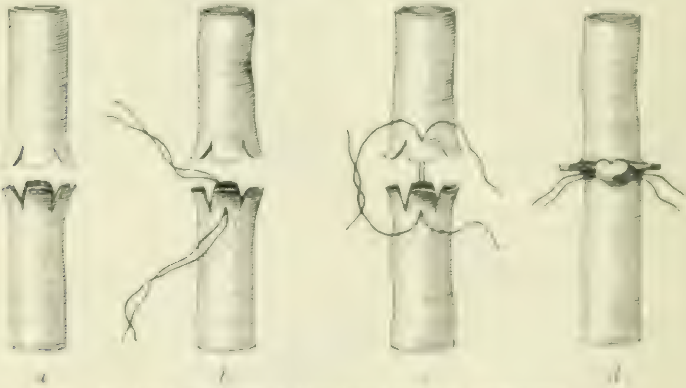

Fig. 7.—Porta's method of end-to-end suture of blood-vessels.

Vein Grafting for Maintenance of a Direct Arterial Circulation.—Hogarth Pringle[5] reports two interesting cases where an aneurysm was excised and the continuity of the artery restored by the grafting of a portion of a vein. In the first case a popliteal aneurysm was excised and a gap of 4 in. left in the artery; a piece of the internal saphenous vein 4 in. long was excised, and each end was sutured by Carrel's circular suture to the divided ends of the popliteal artery. Recovery was uneventful. The second patient was a boy who had a traumatic aneurysm of the right brachial artery. This was excised and treated in the same way, with a successful result.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1913, i, [illegible]; [2]*Ann. Surg.* 1912, i, [illegible]; [3][illegible] 1912, xxv, [illegible] (see also MEDICAL ANNUAL, 1913, 112); [4]*Brit. Med. Jour.* 1913, [illegible]; [5]*Lancet*, 1913, i, 1795.

ARTERIOSCLEROSIS.

Carey Coombs, M.D., M.R.C.P.

DIAGNOSIS.—Hertzell[1] says that if the circulation be completely interrupted by pneumatic pressure in both legs and one arm of a person at rest, the blood-pressure in the remaining arm rises, in normal persons by 5 mm. Hg. in arteriosclerotics by as much as 60 mm. The actual extent of the rise varies, probably according as the sclerotic process implicates the whole or part only of the arterial tree. The explanation lies in this, that the diseased arteries are so hardened that they cannot expand to meet the demand for space thrust upon them by compression of the other vessels and the blood crowded into them therefore rises in pressure.

PREVENTION.—Bishop[2] thinks that periodic chemical examination of individuals past middle life would detect idiosyncrasies to protein and amino-acid poisoning, and would enable us to take steps to prevent these processes from leading to arteriosclerosis and premature cardiovascular decay. He says that for such people saline laxatives are inferior to **Castor Oil,** because of their disturbance of the chemical and osmotic processes of the body.

TREATMENT.—A discussion at the Medical Society of London opened by De Havilland Hall,[3] serves at least to emphasize the close interrelation between high blood-pressure and arterial degeneration. The introducer's remarks on treatment are very practical. He says of men strenuously occupied by mental work, that he endeavours to meet the requirements of the case by suggesting that the patient should leave off earlier than he has been accustomed, and take an afternoon off every week, in addition to the whole of Saturday. It is, however, impossible to lay down any general rule.

As for **Diet,** the amount of meat nearly always needs reducing. In advanced cases, meat, and soups made from stock should be discontinued entirely. The diet should consist of fish, poultry, vegetables, cheese, milk, oatmeal, bread, and farinaceous puddings. Honey has been recommended. Some patients derive much benefit from soured milk. Half a pint to a pint may be taken daily. Excess of salt is injurious. The patient should endeavour to reduce gradually the quantity of food to as little as is sufficient to keep him in good condition. If the patient be instructed to eat very slowly and to masticate his food thoroughly, he will find that he is satisfied with a smaller quantity than would otherwise be required. Should the patient be obese, there will arise certain difficulties about the diet. Sugar should be replaced by saccharin or saxin. Potatoes, turnips, carrots, and parsnips should be eschewed. Crisp toast, plasmon, or gluten bread should be taken instead of ordinary bread. Among biscuits, kalari, akoll, apax, and spartan are useful.

The amount of tea and coffee should be strictly limited. Black coffee should be prohibited. Patients should abstain from alcohol, though in the case of those who have a feeble digestion, or who seem much upset by the deprivation of all alcohol, a small quantity of whisky, say an ounce and a half daily, or an equivalent quantity of a dry sherry or moselle, may be allowed. An abundant supply of water, free from chalk, is desirable. A pint and a half should be drunk daily apart from meals, and preferably hot. If the flat taste of distilled water be objected to, it may be flavoured with a little lemon juice. Less than 2 oz. of tobacco should be smoked weekly, and if the patient can be induced to give it up entirely, so much the better.

A daily tepid or warm bath is helpful; Turkish baths are as a rule contra-indicated. Walking, riding, and golf are suitable forms of open-air exercise for most arteriosclerotics, who often need encouragement in the matter of fresh air. As for drugs, Hall laid particular stress on the management of the bowels, which should act daily without strain; the aperients mentioned, beside **Table Waters**, are **Cascara**, **Pulv. Glycyrrhizæ Co.**, and **Pil. Coloc. c. Hyoscy.** He has lately found **Paraffin** in doses of a dessertspoonful to a tablespoonful, at night and also if necessary in the morning, comfortable and fairly efficient. The **Iodides** are very useful; **Bromide** may be added in the case of restless persons; and for those who cannot tolerate potassium or sodium iodide, **Iodoglidine** or **Iodipin** may be tried. For obese subjects **Thyroid Extract** is useful: the dose should rarely exceed 2½ gr. three times daily. Like most clinicians at the present time, he reserves vasodilators for angiospastic crises (angina, headache).

To people who can afford the time and money, a course of **Spa Treatment** can be recommended with confidence. Among British resorts, Harrogate, Llandrindod, and Strathpeffer are the most beneficial. On the Continent, Contréxeville, Vittel, Vichy, and Kissingen are the most advantageous places. For the obese, Marienbad and Carlsbad are especially indicated.

In the subsequent discussion Luff emphasized the prominent part which intestinal intoxication appears to play in the production of arterial disease, and the important indication for treatment which this affords; and extolled Egypt as a resort for sclerotic persons. By several speakers allusion was made to the harm done by excessive sphygmomanometry; many arteriosclerotics are enslaved by unreasonable fear of high blood-pressure, and it is particularly important to prevent this, in view of the influence of mental stress in the production of arterial lesions.

Intermittent Limp.—Erb's experience of thirteen cases leads him to place this phenomenon among the varied manifestations of arterial disease. His patients were all men, and all except two were over fifty years old. All of them were smokers, six being excessive tobacco consumers. Other possible factors were diabetes, gout, syphilis, renal disease, and overstress. In three cases symptoms analogous to those constituting the limp were apparent in the arm. The treatment consists in removal of the cause or causes, so far as this is practicable; administration of **Iodine** in various forms, inhalations of iodine vapour being particularly preferred; and **Respiration of Air under Lowered Pressure.**

REFERENCES.—[1] *Münch. med. Woch.* 1912, 2077; [2] *Jour. Amer. Med. Assoc.* 1912, i, 803; [3] *Clin. Jour.* 1913, 181; [4] *Berl. klin. Woch.* 1912, 511.

ARTHRITIS, GONORRHŒAL. (*See* GONORRHŒA.)

ARTHRITIS, RHEUMATOID. *Herbert French, M.D., F.R.C.P.*

Billings,[1] with several co-workers, has carried out extensive researches upon cases of rheumatoid arthritis, and lays particular stress upon chronic focal infection elsewhere in the body as the most important causative factor.

Lindsay[2] describes the cases of rheumatoid arthritis in children that have come under his personal observation, and agrees with those who regard rheumatoid arthritis, arthritis deformans, and Still's disease as one and the same thing, due to infective or toxic agencies affecting the articular soft parts and the tissues around them. There is no essential distinction between rheumatoid arthritis in adults and Still's disease in children, though in the latter the malady tends to be more rapid in its progress and more deforming in its results.

Vasomotor Phenomena are well known in connection with rheumatoid arthritis but it is less generally recognized that the vasomotor symptoms may occur not merely in association with the joint lesions, but also as premonitory signs for months or years before actual arthritis develops. That this is so is pointed out by Lindsay,[3] who investigated the subject in connection with 153 consecutive cases of true rheumatoid arthritis (as distinct from osteo-arthritis). Vasomotor disturbances were exhibited by 108, and in 103 of these preceded the joint mischief, and were the earliest sign of anything amiss. The symptoms ranged in degree from slight numbness and blanching of the terminal phalanges of one or several fingers, to changes so severe as to be indistinguishable from true Raynaud's disease. The commonest phenomena were attacks of coldness and numbness of fingers and hands, a tendency for fingers to go dead white on little provocation, recurrent clammy sweatings of the palms and soles, with feelings of discomfort, or of pins and needles, in various fingers or toes. The interval between the beginning of such vasomotor phenomena and the onset of joint inflammation varies from a few weeks to many years.

Gertrude H. G. Hickling[4] investigated the blood-pressure in fifty consecutive cases of rheumatoid arthritis of the hospital class, using Oliver's compressed air-hæmomanometer. The net results found were that the blood-pressures in these cases do not differ materially from those of average persons of the same ages; and the bath treatment had little effect upon them.

The same writer, in another paper,[5] analyzes the clinical aspects of 100 consecutive cases of rheumatoid arthritis in women who came to Buxton for treatment. She summarizes her observations as follows:—

Reckoning from the time of onset, the disease was more common in single than in married women. Most cases began in the years twenty-one to twenty-five; the onset was earlier when a family history of arthritic disease was present. Occupation had no appreciable influence, except that dressmakers formed a high proportion. Previous health had more often been good than poor. Ten per cent gave a history of rheumatic fever or chorea. An arthritic hereditary tendency was well marked, but the frequency of phthisis in the family history of rheumatoid patients appears to be an independent condition, due only to the prevalence of consumption amongst the hospital class. Predisposing causes are any conditions which lower the resistance of the body. Germ infection is the only exciting agent which affords a satisfactory explanation of the various types of onset. Sudden and gradual onset occurred with equal frequency. At all ages, the majority of cases began in the hands, particularly in the proximal interphalangeal joints. The clinical course was largely influenced by the occurrence of one or more acute attacks. Long quiescent periods were a striking feature. The polyarticular nature of the disease was illustrated, and no joint was immune. Bilateral symmetry was often noted, most marked in the hands, and to a less extent in the feet. Flat-foot was so frequent an accompaniment as to suggest the advisability of prophylactic measures in all cases. Valvular heart disease occurred only in cases with a history of acute rheumatism. Tachycardia was the rule, and pulse-rate bore no relation to the duration of the disease. Imperfect mastication from absence of teeth accounted for a number of the frequent cases of dyspepsia. Menstruation had usually no effect on joint symptoms. Vasomotor disturbances and trophic changes were often present. A tendency to goitre was relatively frequent, whilst nearly one-third of the cases had had enlarged lymph glands. Heberden's nodes were only observed in six patients, all over forty, but subcutaneous fibrous nodules were often met with. The nutrition of the patients was usually poor and the general health depressed, whilst a peculiar type of countenance frequently developed.

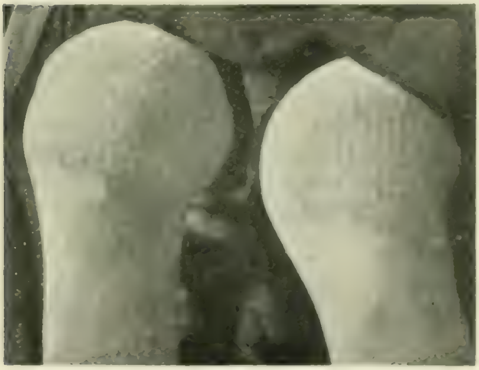

Fig. 8.—Rheumatoid arthritis, showing the œdema of the knee joints.

Hickling draws attention to the pronounced local œdema that accompanies the swelling of the joints; this is shown by the ribbed-stocking marks in the accompanying illustration (*Fig.* 8).

TREATMENT.—In regard to treatment of the disease in *children*, Lindsay[7] says the first thing is to try and find the source of infection; a systematic examination of all the orifices of the body—the mouth, nose, ears, rectum, and vagina—ought to be made, and any infective focus treated; a **Vaccine** may be prepared, if possible, and used. All cases, he believes, should be **Kept in Bed** at their onset, this being the obvious line to follow in the more acute stages with painful joints and constitutional disturbances. **Complete Rest** of the affected joints is essential during the early stages. Rest alone will give more relief to the pain in the joints than any local applications or general medicinal treatment. Even cases with insidious onset should be rested, as getting about on joints subacutely affected is harmful and prolongs the attack on the joint. If possible, as soon as the case is diagnosed, and if the means of the parents permit, such children ought to be taken to some part of the country which most closely approximates to the ideal climate—dry, warm, equable, inland, preferably highly situated and well sheltered. It is disastrous to allow such children to be subjected to damp and to wide variations of temperature.

Diet.—During the febrile stages the patient should be kept on a milk diet. In all other stages the diet should be a generous one. Cream, butter, and other fatty foods are particularly indicated, and are well borne.

Medicinal Remedies.—There is no specific. **Guaiacol Carbonate** gr. 5. t.i.d., administered over a period of several months at a time, is considered by many to do good. **Syr. Ferr. Iodidi** is another useful drug. The **Salicylate** group is very uncertain in its action. In some of the more acute cases, however, salicylates seem to cut short the attack and relieve the arthritic pain. **Aceto-salicylic Acid,** in small doses of 3 to 5 gr. t.i.d., or oftener on painful days, is a favourite remedy, but should not be employed over a long period of time. General tonics are frequently indicated, as these patients are so often in a low state of health. **Local Applications** to the affected joints, such as oil of wintergreen, iodex, lin. pot. iodidi c̄. sapone, are useful in the various forms of joint stiffness and pain. The writer has had some experience of **Bier's Congestive Treatment** of joints in this condition, using elastic-webbing bandage around the limb proximate to the joints affected. In one case the result was exceedingly satisfactory. It is of benefit to begin **Massage** as soon as there are any signs of muscular wasting. This ought to be carried out under strict medical supervision. It must be given very gently, and only over the selected areas where wasting occurs over muscles, either singly or in small groups. Care must be exercised not to interfere with acutely inflamed joints. If massage can be carried out several times each week it ought to be done, but would, of course, be discontinued if the manipulations affected the patient adversely in any way. The results obtained may not be very obvious, but will in all probability do much to avert the very great wasting and contracture deformities which are so distressing a feature in advanced neglected cases. In the later stages, in order to prevent undue stiffness of the joints, **Passive Movements** ought to be carried out. These movements ought invariably to be performed by a masseuse who can be trusted not to apply any force. All movements must be done gently, and must cease instantly should any signs of inflammation in the joints manifest themselves.

Aix-massage, as practised at Bath, Buxton, and Harrogate, is of especial benefit in the later stages. **Vapour** (Berthollet system) baths give relief to the pain and contraction so often present in these cases, and as they are rather exhausting to children, they are generally applied locally only. Benefit may also be got from **Electric Hot Air**.

Such **Surgical** interference as arthrectomies, tenotomies, etc., in order to correct deformities and render limbs of more use, may be considered advisable in the later stages, when the condition has run its course. Lindsay has on several occasions attempted to reduce deformities by straightening out the limbs while the patient was under the influence of a general anæsthetic. In each case, the contractures were easily overcome, and remained so while the patient was anæsthetized, but the condition returned as soon as the anæsthetic influence had been removed. In such cases it does not appear to be of any avail to apply splints, as even after a considerable interval the contracture returns to its former state on their removal.

Vaccines.—Carmalt Jones[6] gives an account of 20 consecutive and unselected cases of rheumatoid arthritis in which, as the result of finding *Streptococcus fæcalis* in abundance in the stools, he used a vaccine prepared from this streptococcus. One case was cured, 6 were greatly improved, 6 more showed some improvement, 6 remained unchanged, and 1 became much worse. He concludes that some cases are due to the absorption of streptococci from a portion of the alimentary canal, and may be much benefited by streptococcal vaccines.

Warren Crowe[7] holds that much information as to the bacteriology of rheumatoid arthritis is to be obtained by examination of the urine. He finds it unnecessary to catheterize the patient, provided the latter is intelligent; if he is supplied with a small sterile specimen tube, the mouth of the latter may be held for a moment in the stream of urine towards the end of micturition, and the necessary specimen thus obtained with the greatest ease. After centrifuging, the deposit is examined microscopically and planted out on an agar plate. After forty-eight hours, all varieties distinguished are subcultured on blood-agar and subsequently differentiated by Fleming's neutral egg medium. He describes in considerable detail a "staphyloid coccus" which he has found in so large a proportion of cases that he thinks it must be the causal factor in many. The behaviour of a vaccine prepared from this staphyloid coccus is very different from that prepared from ordinary staphylococci, in that even a dose of 400,000 may cause a severe reaction, and until the urine is free from organisms more than 5 million can seldom be given. The vaccine therefore has to be used with great caution. Soltau[8] has also worked with Crowe's staphyloid coccus *A*, and supports the view that it is a causal factor in the arthritis. He emphasizes the need for the use of very small doses of the corresponding vaccine; in one case the dose had to be reduced to one of 140,000 at first; he made the injections commonly at intervals of a week. When reaction occurred, it usually took the form of an increase in the joint pains and swelling, with slight rise of temperature. The best dose to begin with is, in his opinion, 500,000 or less, increasing quite cautiously to a maximum of less than 5 million.

Hughes[9] confirms what others have found, namely, that it is very seldom possible to obtain cultures from the fluid withdrawn by puncturing the affected joint, either in gonorrhœal or in rheumatoid arthritis, but he is in favour of the use of autogenous vaccines prepared from any obvious source of sepsis in these cases. The commonest foci of infection are the teeth, the nose and nasopharynx, chronic otorrhœa, the lungs, the intestinal tract, the uterus, the vagina, and the urethra. He classifies gonorrhœal arthritis as only one variety of rheumatoid arthritis, and regards it as the type of rheumatoid arthritis which best lends itself to autogenous vaccination.

One of the chief difficulties in carrying out vaccine treatment in rheumatoid arthritis lies in the obstacles to determining the causal organism in a particular case. Puncture fluid from the joint is generally sterile. There may be pyorrhœa, otorrhœa, or vaginal discharge, or what not, but it does not follow that the organisms in any of these are really the cause of the joint lesions also. Blood cultures remain sterile in most of the cases. Hastings[10] has therefore prepared suitable antigens, so that he can test the patient's blood-serum by a complement-fixation method, analogous to Wassermann's syphilis reaction, against streptococci, gonococci, pneumococci, and so on, and thus form an opinion, based on something more than mere guesswork, as to whether one or other of these suspected organisms—and if so, which—is the cause of the rheumatoid arthritis.

Porter[11] speaks well of the use of **Phylacogen** injections in rheumatoid arthritis. His was a single case only, so that little conclusion can be drawn from it; but when other remedies had failed, phylacogen was used, ten injections in all being given; 2½ c.c. each day for four days, 5 c.c. on the fifth; then an interval of four days, and a repetition of the course.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1913, ii, 819; [2]*Edin. Med. Jour.* 1913, i, 337; [3]*Clin. Jour.* 1913, i, 268; [4]*Med. Chron.* 1913, Oct. 25; [5]*Ibid.* 1913, Mar. 317; [6]*Brit. Med. Jour.* 1913, i, 1047; [7]*Lancet,* 1913, i, 1377; [8]*Ibid.* 1379; [9]*Brit. Med. Jour.* 1913, i, 1267; [10]*Jour. Amer. Med. Assoc.* 1913, i, 1208; [11]*Lancet,* 1913, i, 1588.

ARTHRITIS, SYPHILITIC.

Herbert French, M.D., F.R.C.P.

Baetz[1] had the opportunity of investigating 100 consecutive cases of acute arthritis among negro labourers on the Panama Canal, and found 63 of them to be syphilitic. Although there may be other syphilitic manifestations in some patients, in most the joint lesions afford the only symptom. The average patient is admitted to the ward with a multiple, rather subacute, arthritis; as a rule there is no fever, and the joint pain is severe only on pressure. The joints usually involved are the knees, elbows, sternoclavicular, ankle, and wrist. The finger and toe joints are seldom affected. There is moderate swelling, but marked effusion is rare; the involvement of the periarticular bursa and of the tendon sheaths is very uncommon; in other words, the inflammation is limited to the joint, which is merely boggy and tender to pressure. The most common concomitant sign of syphilis was acute osteo-periostitis of the sternum and of the long bones, especially of the lateral surface of the tibia, the patient usually being very sensitive even to moderate pressure when this exists. Most of the cases occurred in the late secondary stage, the Wassermann test was positive, and with treatment by **Iodide of Potassium** and **Mercury**, or, better still, by **Salvarsan**, the arthritic pains disappeared rapidly and the swelling became scarcely noticeable.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1913, i, 1069.

ASTHMA.

J. J. Perkins, M.B., F.R.C.P.

ETIOLOGY.—Dundas Grant[1] reviewing the influence of *nasal disease* in the causation of asthma, states the present position with admirable candour. The experiments of Dixon and Brodie, proving the presence of constrictor and dilator fibres governing the bronchial calibre, the most important reflex for which they found in the nasal mucosa, especially over the upper and posterior parts of the septum, would predispose one to believe that the condition of the nose must have an important connection with the disease. Grant quotes figures from West of 500 cases of asthma with pathological nasal changes in 145, and on the other hand of 650 cases of nasal polypus with asthma in but 47. It is therefore obvious that nasal polypus is not a frequent cause of asthma, but that in asthma various pathological nasal changes are comparatively frequent.

As to the effect of **Nasal Operation** on asthma, it is interesting to note that of Lublinsky's 143 cases, 27 were cured and 13 improved. Dundas Grant himself found in 107 cases of asthma sent to him at the Brompton Hospital that there were 68 with nasal changes so well marked as to call for operation, 31 in which the changes were so slight that operation was not indicated, and 8 with no nasal abnormality. Reports were obtained later from 44 of the sixty-eight cases in which a definite operation was undertaken. Cure was obtained in 8, great improvement in 2, improvement in 23, no improvement in 11. Of the 11 who reported no improvement, 4 came up for further examination, and it was found that in all nasal disease was still present. It is interesting to note the wide spread of the nasal disease, as indicated by the nature of the operations, and the comparatively small part that nasal polypi played. Submucous resection of the septum was done in 7; galvano-cautery to the septum for turgescence of the tubercle, 10; galvano-cautery to turbinals and septum, 1; to turbinals, 6; removal of nasal polypi, 6; of hypertrophied anterior lip of hiatus semilunaris, 2; of adenoids, 4; of portion of middle turbinal, 8; opening antrum of Highmore, 4. In conclusion, Grant says that in every case of asthma a rational investigation as to the presence of signs or symptoms of nasal disease should be made, while in any case of nasal disease the presence of asthma is an additional indication for activity in treatment.

Speaking of asthma in children, Dillingham Smith[2] controverts the opinion held by the majority of authors that the greater number of cases do not start till between five and ten years of age. Though the dry adult type with its intense dyspnœa is not common before five years, there is a distinct type of infantile asthma which may commence, according to his experience, almost as early as birth. In 34 cases seen by him, no less than 20 had their first attack within the first twelve months of life, figures supported by Comby, who in 75 cases found 56 under three years of age. Two types of asthma, then, can be met with in childhood: one appearing between birth and five years of age, the second between five and ten years. Smith describes the latter as a dry asthma, dyspnœa being the prominent feature, the former as a moist asthma, the predominant feature being the accompanying or following bronchitis. The dry form of later childhood need not detain us, as it conforms so closely to the adult type; the description of the symptoms of the early or infantile type will not be out of place, as the true nature of the condition at first sight is not easily recognized. Commonly, the attack is of the following nature: a young child or infant has a cough or symptoms of slight bronchitis, in the midst of which he is seized with a breathlessness which suggests broncho-pneumonia, though on examination dyspnœa is found to be out of all proportion to the physical signs in the chest. After lasting a variable time, the attack is followed by a period of bronchitis with numerous rhonchi and rales, which may last for two or three weeks. The attack is succeeded at some later date by a fresh outbreak of bronchitis and breathlessness, and in this recurrent character Smith finds the clue to asthma in early life, an especially valuable point, as the dyspnœa is frequently not especially intense. Laryngitis stridulosa causes most difficulty in differential diagnosis, according to this author. A child who has had a little catarrh during the day wakes up suddenly with intense difficulty in breathing; there is an incessant ringing or barking cough, a hoarse voice, considerable inspiratory stridor, and restlessness: such attacks as are frequent in a child with any inflammatory condition of the upper respiratory passages. The pallor, the cyanosis, the expiratory stridor, the unaltered voice, and the immobility characteristic of true asthma should prevent mistake, while the physical signs of the two cases are entirely different. In asthma the chest is distended and motionless, while in laryngitis respiration is free except for the laryngeal obstruction; the stridor in asthma is expiratory, in the laryngeal cases inspiratory. In contrast with broncho-pneumonia, the recurrent nature of the attacks, the absence of fever, the intense dyspnœa out of proportion to the physical signs, stamp the case as one of asthma. As regards the chest, hyper-resonance and diffuse moist sounds, as against the evidence of consolidation in pneumonia, are the criterion. Whenever there is a history of recurrent attacks of pneumonia in childhood, asthma may always be suspected; and Smith quotes a case of a boy, aged five, who had been admitted to hospital on four separate occasions for pneumonia, but when seen by him in what was supposed to be a fifth attack had typical asthma.

TREATMENT.—Smith speaks of the importance of first of all **Relieving any Source of Irritation** or chronic ill-health, such as adenoids, constipation, and rickets. He has seen the regulation of the bowels, or a course of rhubarb and soda, effect a cure when dosage with iodides and the antispasmodics has failed. The immediate drug treatment he considers under two heads: (1) during an acute attack, (2) during the interval. If the attacks only occur at night, he gives at bedtime a regular mixture of **Potassium Iodide, Belladonna,** and ethereal tincture of **Lobelia,** and finds it safe to give ½ gr. of iodide for each year of life, 2 to 10 min. of belladonna from infancy to ten years, and lobelia in minim doses for every year of life up to 5 min. If the attacks occur by day as well as by night the same prescription is given in smaller doses three times a day. The iodides, in his experience, are the sheet anchor in this disease in early life; they should be given for six or eight weeks, then omitted for a fortnight and replaced by arsenic, after which the course of iodides can be renewed. Of other drugs he does not speak very highly. He has never made use of morphia himself in the attack, nor indeed of any of the sedatives, except a little **Bromide** or **Phenazone** when the child is hyper-excitable. An injection of 3 to 5 min. of **Adrenalin** can be given; while in an acute attack in an infant, **Hot Baths** have a sedative effect, or the kettle with **Medicated Steam** may be tried.

REFERENCES.—[1]*Pract.* 1913, i, 914; [2]*Ibid.* 924.

AURICULAR FIBRILLATION. *Carey Coombs, M.D., M.R.C.P.*

To the full description given in last year's MEDICAL ANNUAL of this condition, usually a terminal phase of chronic cardiac disease, little need be added. The cardinal features are total irregularity of the pulse and disappearance of the evidences of auricular systole (absence of presystolic bruit, of "A" wave of jugular curve, and of "P" variation of electrocardiogram).

ETIOLOGY.—Lea's[1] summary shows the etiological importance of rheumatic carditis, which usually brings about this form of cardiac failure by causing mitral stenosis (thus presumably leading to auricular over-stress, with subsequent degeneration); a history of rheumatic infection was obtained in 43 per cent of his cases, and it is to be presumed that a considerable proportion of those in which no such history was forthcoming were nevertheless rheumatic. G. A. Sutherland and the present writer[2] record a case of fulminating rheumatic carditis in which the signs of auricular fibrillation developed, and were associated post mortem with extremely severe inflammatory and degenerative changes throughout the myocardium, particularly in the left ventricle and the right auricle. Cohn,[3] on the other hand, failed to find any definite lesion in the hearts of three horses who exhibited this type of arrhythmia during life; and Gossage and Braxton Hicks[4] quote cases which suggest that it may arise in previously healthy hearts, and that in such its essential cause may be outside the heart altogether. [The writer has under observation a case which lends strong support to this hypothesis.—C. C.]

TREATMENT.—Cushny, Marris and Silberberg[5] find that the action of **Digitalis**, which is often so wonderfully beneficial in auricular fibrillation if given in adequate doses, is to be ascribed to its direct effect on the myocardium, augmenting its contractile power, and not to any indirect vagus-stimulating action. They agree that its reduction of pulse-rate may be due to depression of conductivity or of the excitability of the myocardium; but they look upon these effects, if present, as dependent entirely on the cardiotonic action of the drug. This is true of allied drugs, such as strophanthus, as well as of digitalis itself.

Eggleston's[6] investigations show that digitalis causes vomiting only after absorption into the general circulation, and not by virtue of any gastric irritant effect. The moral of this is that the use of digitalis in cases otherwise suitable is not to be prohibited on account of gastro-intestinal symptoms.

REFERENCES.—[1]*Lancet*, 1912, ii, 1215; [2]*Heart*, v, 15; [3]*Ibid.* iv, 221; [4]*Quart. Jour. Med.* 1913, July, 435; [5]*Heart*, iv, 33; [6]*Jour. Amer. Med. Assoc.* 1913, ii.

AURICULAR FLUTTER.

Carey Coombs, M.D., M.R.C.P.

This has emerged as an interesting entity, during the last year or two, from several clinical groups in which it had hitherto been buried. Papers by Ritchie,[1, 2] Lewis,[3, 4] Hay,[5, 6] Hume,[7, 8] and others have given clearer definition to our ideas on the subject, though much remains obscure and nebulous. The term "auricular flutter" should be reserved for a condition in which the auricles beat regularly at a rate of 200 per minute, or faster still.

ETIOLOGY.—Some causative factor is apparent in nineteen out of twenty-eight cases; cardiosclerosis in seven, and chronic valvular disease of the post-rheumatic type in six, head the list. There are but three possible examples originating in acute cardiac disease; two of Hume's[8] diphtheritic arrhythmias gave some indication of flutter, and in one of Lewis's cases the irregularity seemed to arise in an attack of influenza. Practically all the patients were adults, the majority having reached or passed middle life. In nine out of twenty-eight cases the heart was apparently normal. Neither exertion nor emotion, nor any of the conventional provocatives of cardiac over-stress, appears to play any dominant part in determining its onset.

PATHOLOGY.—The only definite observation relating to the morbid anatomy of this condition emanates from Ritchie.[2] In his case, one of the post-rheumatic variety, there were the usual diffuse degenerative phenomena, but showing no particular localization. The fact that auricular flutter is a penultimate phase in many cases, coupled with its almost invariable association with chronic cardiac disease, suggests that it is an outcome of degenerative changes, and not of inflammation, as a rule. This is in accord with its close relation to auricular fibrillation. Observations by various workers lend support to the view expressed by Lewis,[3] that there is a series of perversions of auricular function, extending from single premature auricular contractions at the one end, through small groups of the same and paroxysms of tachycardia from simple auricular [illegible] to auricular flutter, and thus on to auricular fibrillation. Ritchie[2] has noted a stage intermediate between the last two. Translating this concept into simpler language, what is suggested is that the degenerating auricular wall becomes over-excitable; that this occurs at first occasionally and in one spot; that later a spot of this kind becomes the source of a rapid regular rhythm; that to this foci others of the same kind, leading to a multiplication of abnormally fast rhythms, are added; and that the final result, auricular fibrillation, represents a condition in which the normal auricular rhythm has been entirely replaced by multiple rhythms arising from many auricular foci, these rhythms racing one another in a confused medley into the ventricle through the auriculo-ventricular connections, whose capacity for transmitting such impulses is fortunately so limited that many of these irregular stimuli are hindered from troubling the ventricle.

Symptoms.—It is not a disease, scarcely even a syndrome; it is rather itself a symptom. As such it may occur in connection with heart disease in any phase, or with no appreciable cardiac lesion whatever. Like paroxysmal tachycardia, its onset and offset are abrupt, but unlike the former, outbursts of which are usually brief, flutter continues for weeks, months, or years as a rule. It reacts but little to external stimuli, though it is influenced by digitalis in a manner noticed below. The arterial pulse varies widely, and is absolutely unreliable for diagnosis of the condition, the reason being that the conduction paths usually fail to transmit more than a certain proportion of the abnormally rapid stimuli from auricle to ventricle. Often it is a definite fraction, half or three-quarters, of these stimuli that is arrested; so that if the auricle is beating at 300, the radial pulse beats at 150 or 75. Even this is not all, however; those impulses that do come through from auricle to ventricle may be delayed in transmission by a variable interval, the result being that the pulse becomes irregular and sometimes simulates that of total arrhythmia.

Diagnosis.—For this graphic records are always essential. Whenever possible, all cases suspected of flutter should be examined electrocardiographically; but when this is not feasible, polygraph records may display the presence of flutter in the form of a fast, regular wave in the jugular trace. The auricular tachycardia is much more clearly visible in the electrocardiogram, as reference to the records of Ritchie[2,3] and Lewis[4] show.

Prognosis.—Auricular flutter has no grave significance so far as is known, except when it occurs in cases of organic heart disease. Here its importance is twofold; it betrays a fairly advanced degeneration of the auricular musculature, and it adds to the burden of the heart by excessive speeding up of the ventricle.

Treatment.—We can fortunately, by means of **Digitalis**, **Strophanthus**, and allied substances, bring about some improvement. Full doses should be given, and two kinds of effect looked for. In favourable cases auricular flutter gives place to fibrillation, and on continuing the drug this is in turn replaced by the normal rhythm. Even when digitalis fails to bring this about, its depressant action on conductivity cuts down the number of stimuli troubling the ventricle, which is by this means afforded a more ample measure of diastolic rest. It is always prudent, even in the absence of obvious cardiac lesions, to rest patients while their treatment is being carried out.

REFERENCES.—[1]*Edin. Med. Jour.* 1912, ii, 485; [2]*Quart. Jour. Med.* 1913, vii, 1; [3]*Heart,* 1913, iv, 171; [4]*Lancet,* 1912, ii, 1418; [5]*Liverp. Med.-Chir. Jour.* 1913, 88; [6]*Lancet* 1913, ii, 686; [7]*Quart. Jour. Med.* 1913, vi, 255; [8]*Heart,* 1913, v, 25.

BERI-BERI.

Leonard Rogers, M.D., F.R.C.P.

During the past year several workers have continued experimenting on the relation of *diets* to beri-beri. R. P. Strong and B. C. Crowell[1] have carried out carefully controlled observations on a number of condemned prisoners in the Bilibid prison at Manila. The men were isolated in two separate batches; all their food was weighed, the amount not eaten by each being also estimated. The polished white rice was specially milled and analyzed, including the percentage of phosphorus, and every possible precaution taken to exclude any source of fallacy. The men put on white rice plus uncooked rice polishings, after a few days refused to continue it, so the control group were then fed on red rice plus the special diet which all the groups received. A second group received white rice plus alcoholic extract of rice polishings, while two further groups received only white rice plus the special diet common to all, which included bacon, onions, lard, bananas, starch, and sugar, in measured amounts. On the ninety-seventh day for the first three groups and the eighty-first day for the fourth (white rice) group, 100 grams of potatoes and 30 grams of dried codfish had to be added on account of serious loss of weight of most of the men. In Groups II and IV on white rice, 4 out of 6 and 4 out of 11 respectively developed typical beri-beri, including cardiac and sensory symptoms, with complete loss of knee-jerks, while 2 more in each group showed early symptoms of the disease. One more showed doubtful signs, while only 3 out of the 17 escaped entirely. On the other hand, of 6 men in Group I on white rice plus extract of polishings, 4 escaped altogether, and 2 developed early symptoms of beri-beri, showing that the amount of the protective substance in the extract of the polishings was small. Lastly, of 6 men on red rice only, 1 developed rather marked symptoms of beri-beri, and another only slight cardiac symptoms, while in the remaining 4 no signs appeared. A post-mortem on one fatal case on white rice showed characteristic lesions of beri-beri, both naked-eye and microscopical. In all the groups there was marked loss of weight. In the definite cases the disease developed in from 61 to 75 days on white rice. As infection and bad hygienic surroundings were excluded, it is clear that the white, or polished, rice diet was the cause of the disease, although the fact that one fairly marked case developed on red rice shows that if the diet is very monotonous for a long time, and much weight is lost, such a diet may occasionally produce the disease. The extract of the polishings is evidently inferior as a preventive to certain beans and to yeast, while the latter are far cheaper. As they found that a white rice containing 0·37 of phosphorus pentoxide produced the disease, they think a higher limit than 0·4 should be adopted in any legislative measures taxing white rice as a **preventive measure against beri-beri.**

E. B. Vedder[2] reports further experiments to determine the nature of the protective substance. He found that a diet containing a sufficiency of all the alimentary principles may yet be deficient in the beri-beri preventing substance. This accounts for cases reported on diets other than white rice. By a process of exclusion he found that the preventing substance is not volatile, is not an inorganic salt, and is probably not an alkaloid, so that it is probably an organic base, as claimed by Funk; and although Vedder failed to confirm his work, he thinks this may be due to slight differences in his method of extraction. In a paper by Vedder and E. Clark,[3] the symptoms and pathology of the disease are fully discussed and illustrated on the extensive basis of their numerous experiments. Great prostration and symptoms of neuritis are combined in varying proportions in different cases, the former being the more rapid and serious, and also most quickly cured by extracts of the rice polishings, while the nerve signs take a long time to disappear. Degenerative changes were always found in the sciatic nerve, even if no symptoms of neuritis had been present. Changes were also found in the grey-matter cells of the lumbo-sacral cord, showing that the central nervous system is also affected. They suggest that two different vitamines may be essential for proper metabolism, the absence of one producing prostration and cardiac failure, and that of the other neuritis, which would account for the **different types of the disease.**

Casimir Funk[4] has further investigated the chemical properties of the vitamine he isolated from yeast, and has separated it into three different substances with different melting points and solubility, but advises the use of the whole vitamine-fraction in the treatment of **beri-beri.**

Edie, Evans, B. Moore, Simpson, and Webster,[5] working in Liverpool, have continued testing the value of various additions to a rice diet in preventing or curing polyneuritis in animals. For this purpose casein, nuclein, and lecithin proved ineffective. They confirmed Fraser and Stanton's statement that alcoholic extracts of rice meal have protective and curative properties if concentrated under a fan, and not on a water-bath. They next made yeast extracts with large quantities of methylated spirit, and obtained a substance with powerfully protective and curative action, which on further purification yielded feathery crystals. This they have analysed, and estimated its probable formula. Creighton Wellman, C. C. Bass, and A. C. Eustis,[6] working at New Orleans, have found that white polished Louisiana rice will produce neuritis in fowls fed exclusively on it, while the same rice unpolished has no such effect. Pure corn starch also produces the disease rather more slowly, while a pure cane sugar diet produces it more rapidly than a polished rice one.

W. Caspari and M. Moszkowski[7] record an experiment in which the last-named placed himself on a polished-rice diet in Berlin for 230 days. Exact metabolic observations were made for 138 days. Constipation was the first symptom, followed after a month by nervous and cardiac symptoms, and œdema of the lower extremities developed. He was cured rapidly by adding extract of rice polishings to the diet. The analyses show a very great destruction of protein, which they think can only be explained by a severe toxic action, and they therefore hold, in opposition to nearly all other observers, that beri-beri is due, not to a deficiency of the diet, but to an intoxication.

W. L. Braddon,[8] who was the first to demonstrate conclusively that beri-beri was produced by a diet composed almost exclusively of polished rice, from which the outer albuminous layers had been removed, records the great reduction of cases and mortality in hospitals, asylums, etc., in the Malay States. S. Shibayama[9] discusses the present state of the study of beri-beri in Japan, and says no final conclusion can be arrived at, the rice theory not being a complete solution of the question in that country. B. Nocht[10] accepts the rice theory. He has not found rice-bran or yeast satisfactory in the treatment of beri-beri, but prefers raw food-stuffs, or extracts of them, which probably contain a number of vitamines, all of which are necessary to health.

Carl Lovelace[11] describes the extensive prevalence of beri-beri among labourers constructing a Brazil railway, in which rice could be excluded as the cause. The case mortality during two years averaged 15·6 per cent. The diet was varied and abundant, and in some cases not a grain of rice had been eaten for many months. The staple foodstuffs of the labourers were dry biscuit, dried and tinned meat and fish, beans, and macaroni, rice having been eliminated on account of the occurrence of beri-beri, but during the following year the cases increased threefold. Among the attacked were six strong young American doctors. In 1910 fresh meat, onions, and potatoes were included in the diet, but cases still occurred, and were more prevalent in some camps than in others.

PROPHYLAXIS.—L. J. McLaughlin[12] writes on beri-beri in infants in the Philippines, and concludes that half the total deaths in Manila were in infants under one year of age, three-fourths of whom were breast-fed. A little over half these deaths he attributes to beri-beri, the mothers of nearly all of them also showing some signs of the disease. The condition can be promptly cured by either feeding the child on fresh cow's milk or giving extract of rice polishings. D. Gregg[13] deals with the same subject, and after a study of the literature accepts the conclusions above stated.

H. Fraser and A. T. Stanton[14] have published a further paper on the prevention and cure of beri-beri in continuation of their previous work. They again discuss a tax on polished rice containing less than 0·4 per cent of phosphorus pentoxide as a preventive measure, and consider that if adopted it should be at the point of distribution, but are doubtful if it is a practicable measure. They have further tested the curative action of alcoholic extracts of rice polishings, and confirm their great value in fowls, and hope to overcome the difficulties in applying this measure to patients affected with the disease.

H. C. Highet[15] has published a full report on beri-beri and its prevention in Siam, which furnishes conclusive evidence in favour of the modern views, and confirms the statement that rice containing less than 0·4 per cent of phosphorus pentoxide is likely to cause beri-beri if it forms the staple diet. He finds that Siam rice if not milled beyond this point is a safe food, and can readily be prepared by hand or steam mills. The incubation period of the disease was about sixty days. The use of undermilled rice, as advised above, has done away with beri-beri in all the Siam government institutions and among the gendarmerie, and is now applied to the army and navy.

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BILIARY TRACT, SURGERY OF.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

It is now generally conceded that early operation affords the patient the best chance of recovery from *infective cholecystitis*. The details of the operative treatment are less clearly defined. The majority of surgeons are content with simple drainage of the gall-bladder. A few make a practice of cholecystectomy, while others reserve cystectomy for gangrenous cases, preferring cholecystostomy for the majority. After considerable experience, Lecène and Cotte[1] prefer **Cholecystectomy** "à chaud," on account of the ease of its execution and the excellence of its results. They hold that it should be the method of choice in all cases of acute calculous cholecystitis, and that cholecystostomy should only be performed when excision of the gall-bladder is impracticable on account of the bad general condition of the patient, the impossibility of exteriorization of the liver, or extensive pericholecystitis. They point out that after cystostomy, peritonitis may develop from secondary perforation of the gall-bladder; they have seen septic infections of the liver or kidneys, and patients have died from secondary septicæmia. And, finally, the troubles of chronic cholecystitis may supervene. The authors describe the technique, and insist on the desirability of draining the cystic duct after removal of the gall-bladder.

Clairmont and v. Haberer in 1910 sought to show the possibility of a "*gallige*" *peritonitis without perforation of the biliary tract*. According to them, there may be a large effusion of bile into the abdominal cavity in cases of common-duct obstruction, without a breach in the walls of the ducts, through which a kind of filtration takes place. They assume some pathological condition of the walls of the ducts which causes this permeability. Wolf[2] also describes three cases in which the abdomen contained a quantity of bile. In one a duodenal perforation was found. In neither of the others could any perforation be discovered, although one was examined post mortem. Nauwerck and Lubke,[3] on the other hand, had the opportunity of examining a case at autopsy which appeared to support Clairmont and von Haberer's theory; but the microscope furnished an explanation in the shape of a minute perforation of the gall-bladder. This was not sufficient to allow the escape of any fluid when the gall-bladder and ducts were tested for leakage by the injection of water. Inspection of the interior of the gall-bladder revealed two or three superficial mucous erosions. The examination of serial microscopical sections showed that one of these really extended through the whole thickness of the wall.

Khantz[1] has been able to find 15 cases of *biliary lithiasis in childhood*; 6 in babies, 5 in children from five to ten, and 4 in girls from thirteen to seventeen. The pathology and symptoms are the same as in adults. Six cases were successfully treated by operation. Non-calculous cholecystitis is even more rare than the above. Khantz could only find 5 cases, 3 of which appeared to be secondary to other infections—appendicitis, scarlet fever, and typhoid. Cholecystectomy was done in 4 cases, three times with success.

Sasse[2] urges that the operation of **Choledocho-duodenostomy** should not be limited to cases of absolute necessity, such as tumours, strictures or loss of continuity of the common duct; but advises its more frequent employment in cases of stone in the common duct, to provide a free drainage of the biliary canals, more especially when cholecystectomy has been performed. He makes a vertical incision in the common duct immediately above the duodenum. After exploring the duct and removing any stones, this opening is sutured with two layers of silk to a vertical incision (transverse to the axis of the intestine) directly opposite to it, in the first part of the duodenum. He reports 10 cases with good results.

Gall-stones of a sufficient size to cause obstruction may enter the intestinal tract in three ways. They may erode their way through the cystic and common ducts by a combination of dilatation with pressure necrosis and ulceration; the duct or gall-bladder containing the calculus may become adherent to the stomach or bowel, a direct perforation between the viscera allowing the stone to escape into the intestinal tract; or it may perforate the gall-bladder or duct and become enclosed in a local abscess, which may subsequently empty itself into the stomach or intestine. Having reached the intestine, the favourite seat of impaction of the stone is in the lower ileum. Babcock[3] records an unusual case of *pyloric obstruction* caused by a gall-stone in a woman who had a large umbilical hernia distended with pus and gas. Some weeks after incision a sinus still remained.

through which food escaped shortly after it had been swallowed. Three and a half months after the abscess had been opened, the sinus had healed, but there followed pyloric obstruction. Operation was done under spinal anæsthesia, as the patient was in very bad condition. The sinus was opened up and found to lead to a perforation in the anterior wall of the stomach. Immediately below the pyloric ring was an enormous gall-stone, which was pulled back into the stomach and removed. Death occurred twenty-four hours later.

On several occasions Stetten[7] has observed fistulæ or symptoms of biliary obstruction after simple cholecystostomy. Some of these cases were re-opened, but the ducts were found free. After cholecystostomy, or after freeing and closing the gall-bladder and dropping it back in the abdomen, the patient would be cured. He found the explanation in a recent case of cholecystostomy, in which the gall-bladder was sutured to the parietal peritoneum. On removing the tube a week after operation, the discharge promptly ceased. One week later, biliary obstruction developed; at the second operation, the junction of the hepatic and common ducts was found kinked by traction of the gall-bladder (*Fig.* 9). Cystectomy cured the condition. Stetten considers the possibility of this occurrence is an indication against cholecystostomy, and he says that primary cystectomy is a certain means of preventing it. [This overlooks the fact that traction on the gall-bladder during cystectomy may lead one to ligate the hepatic or common duct; if cholecystostomy is performed without suturing the gall-bladder to the peritoneum, a perfectly satisfactory method, the accident will not occur.—H. G. A. M., H. D.]

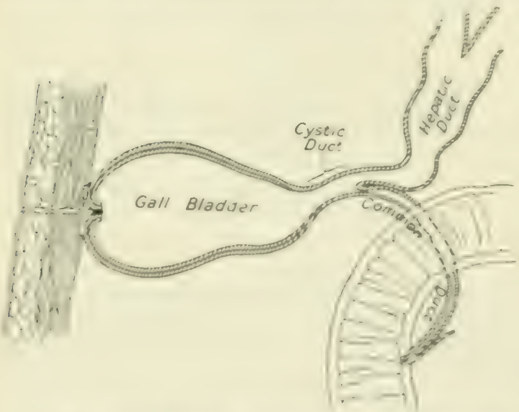

FIG. 9.—Diagram showing [illegible] of the junction of the hepatic and common ducts after cholecystostomy. Note kinking of the hepatic duct, and [illegible] between the [illegible].

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BLACKWATER FEVER.

Leonard Rogers, M.D., F.R.C.P.

In 1912 Leishman, in a paper on "Cell Inclusions in the Blood of a Case of Blackwater Fever," described certain bodies showing chromatin staining, and soon after reported finding similar bodies in another case, and suggested they might be protozoal parasites. G. C. Low[2] soon after reported having seen similar bodies in the leucocytes in the blood of cases of fever from Borneo as well as in pellagra, so they are not peculiar to blackwater fever. A. C. Coles[3] has also described red-staining granular structures in the blood of a case of blackwater fever, and is inclined to agree with Leishman in thinking they may be parasites of the nature of the chlamydozoa of Prowazek. G. C. Low and C. M. Wenyon[4] criticize the above-mentioned papers, and describe similar bodies in cells of both the hyaline endothelial types in cases of anaemia and sleeping sickness, as well as in large numbers in the peritoneal exudate of a mouse inoculated with *Leishmania tropica*. They conclude that the bodies are not related to any particular disease, nor can they possibly be parasitic in nature. Coles' appearances they consider to resemble artefacts more closely than anything else, while they have never seen them in blackwater-fever cases. Ashburn and Vedder[5] describe a spirillum in the blood of a case of blackwater fever.

TREATMENT.—H. S. Stannus[6] discusses the treatment of suppression of urine in blackwater fever, and records a case in which he tried **Incising the Kidney** for this condition. Some urine was secreted through the wound, but the patient succumbed five days later without having shown any material improvement.

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BLADDER, DISEASES OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Tumours.—Howard A. Kelly and Robert M. Lewis[1] give an interesting account of the skiagraphic demonstration of vesical tumours. This was obtained by introducing into the bladder a suspension of bismuth subnitrate with gum tragacanth. The bismuth settled at the base and powdered several large papillomatous growths, so that their outline and cauliflower-like contour were demonstrated on an *x*-ray plate. In a second case, the bladder was injected with 40 c.c. of a 5 per cent silver iodide emulsion. About half the amount injected was then voided, and the bladder was distended with air. The tumour was seen surrounded by a halo of dark shadow, and outside this again was a light zone produced by the air.

Chute[2] thinks that the tardy recognition of bladder tumours is not often due to lack of symptoms, but to a want of appreciation of their significance and importance. In a large proportion of cases the early symptom is bleeding. This occurs in other conditions, and when it is the only symptom there is a very unfortunate tendency to assume that it has a less important origin, and to wait and see if it recurs. The recurrence will often not be for weeks or months, and again the bleeding ceases promptly under almost any treatment. It should be clearly understood by practitioners that any haematuria may be a sign of very serious bladder disease, and should be looked upon with suspicion until its source and cause are clearly demonstrated. A very large proportion of bladder tumours are malignant from the start in that they infiltrate the bladder wall and lead to metastases. Some that are apparently benign at the beginning tend later to infiltrate, while others that do not show any tendency to infiltrate tend to multiply and shorten life by hæmorrhage.

R. F. O'Neil[2] records observations on his **Operative** technique in ten cases of bladder tumour. Suprapubic cystotomy was employed for the removal of papillomata with small pedicles which did not involve the ureteric orifices. The patient was placed in the Trendelenburg position and the tumour excised with a margin of normal tissue. If it were situated near one of the ureteric orifices, a catheter was introduced, the pedicle grasped with a right-angled clamp, and the growth excised. The wound was closed with continuous catgut suture. The cystotomy wound was closed in two layers, a small rubber drain placed in the prevesical space, and a catheter introduced into the urethra. In one out of the four cases in which this method was used, the catheter became plugged, necessitating reopening of the suprapubic wound, and a sinus persisted for weeks. Transperitoneal cystotomy was the operation of choice in all cases of sessile and infiltrating growths, except those so extensive as to require total cystectomy.

In discussing the results of **Operation** at the Mayo Clinic, E. S. Judd[3] states that 114 cases of primary tumours of the bladder were examined, the average age being 53·1 years. These tumours were classified according to their clinical course into benign and malignant. There were only two benign cases (fibromyomata); all the rest, which include papilloma and carcinoma, were regarded as malignant. The method of operative procedure must be determined by the general condition of the patient and the cystoscopic findings. Arteriosclerosis, renal insufficiency, myocarditis, etc., are factors contraindicating radical procedures. Bimanual examination by vagina in the female and by rectum in the male is most important in the diagnosis, as thus we may be able to determine the presence and extent of induration, and cases will be eliminated in which operation might otherwise be attempted. The cystoscopic examination is most important, not only in determining the number, location, and extent of the lesions, but also in helping to differentiate a bleeding hypertrophied granulating surface from a true neoplasm. When possible, a portion of the growth, large enough for microscopical examination, is excised through the cystoscope. If there are palpable metastases or considerable induration at the base of the bladder, the case is considered inoperable. If there is no induration but a bladder completely filled with growth, the case may still be operable, since the pedicle may involve a small area only.

One of the chief advantages of the transperitoneal operation is that it affords an opportunity of observing the pelvic lymph-nodes and the abdominal viscera. The prostate is rarely involved except in the late stages; should there be any doubt regarding this, however, the gland should be removed with the tumour. In five cases a prostatectomy was necessary.

In the 114 cases, there were 38 where no operation was done on account of the general condition, the extent of the disease, or the refusal of the patient. Thirty patients were submitted to transperitoneal operation. Three of these patients died, two on the seventh and one on the third day after operation. Of the remaining 27 patients 9 are dead and 17 living, while one is lost sight of. Three patients are well after five years; 10 have lived three years, one probably with recurrence. Of the 17 patients living at present, 4 have been operated on for recurrences. In one case the entire bladder was removed, and the patient is alive without recurrence over two years later. In 33 cases a suprapubic extraperitoneal operation was chosen because the tumour was on a pedicle and not infiltrating the wall of the bladder, or because the patient's general condition would not warrant a more radical procedure. One patient died at the end of three weeks. Four patients are living without any evidence of recurrence six years after the operation, while 8 are free from symptoms three years after operation; 3 have been treated for recurrence.

[It will be noted that these statistics refer to all tumours of the bladder with the exception of fibromyoma. They therefore include tumours which many surgeons classify as non-malignant, and cannot therefore be compared with statistics of operation either on so-called simple papilloma or on malignant growths of the bladder.—J. W. T. W.]

Hartmann[5] records 47 cases of operation for tumours of the bladder. With the exception of one case of myoma, which recurred after two operations and eventually caused death, all the tumours were epithelial neoplasms, papillomata, or carcinomata. There were 15 cases of non-infiltrating tumours, 2 of which were operated on several times for recurrences. The immediate results were good. Two deaths occurred, both from conditions independent of the operation. Nine cases were followed, and there were 6 cases of cure lasting from three to seven years, 2 recurrences, and 1 death. There were 26 cases of infiltrating tumours, in 9 of which a radical operation—partial cystectomy—was performed. There was one operation death, one death from pyelonephritis, and two cures lasting five and nine years respectively. These were cases in which the tumour was situated at the summit of the bladder. In 17 cases a palliative operation only was performed, namely, cystotomy with curettage and cauterization of the tumour. **The operative mortality was high.**

Edwin Beer,[6] who introduced the method of treatment of papillomata of the urinary bladder with the **High-Frequency Current**, says it is unsuitable for malignant growths. For these a transperitoneal operation alone promises good results. In papillomata, however, the recurrences are so frequent (50 per cent) that high-frequency cauterization should be used. The author has received replies from 33 surgeons who have used the method. About 187 cases of vesical papilloma have been treated in America, and 28 in Europe. "Not only are these surgeons satisfied with the simplicity and immediate results, but they are so well satisfied with the end result that all are using the method at the present time." The cases he would exclude from this method are: (1) All papillary carcinomata; (2) All patients that are intolerant of cystoscopic examination; (3) Those few cases that are inaccessible either with the indirect or with the direct vision cystoscope, as well as large growths at the neck of the bladder that bleed severely on the introduction of the instrument.

Horace Binney[2] records his experience of this method in 4 cases. According to the particular form of coil used, the current applied may be of the bipolar or d'Arsonval type, or the unipolar or Oudin type. In the first, one pole is placed in contact with the patient's trunk or limb by means of a broad flat electrode, while the other pole is attached to a pointed metallic electrode placed on the tumour. On closing the circuit a fine stream of sparks is developed which produces a superficial cauterization. In the second (Oudin) type one pole only is necessary. This is connected to a pointed electrode and applied close to the tumour, giving off a similar stream of sparks, the return flow of current passing through the patient, the surrounding objects, and even the air. The effect of this current on tumour tissue is to produce a superficial cauterization at the point of contact of the electrode. This is not fulguration, a term which has been borrowed from the electrotherapeutists, and designates a wholly different electrical effect. "High-frequency cauterization" is the more exact and therefore preferable term. The electrode is brought in contact with the tumour, and on closing the circuit the cauterization is begun. It has the effect at first of blanching the tissue, and after about fifteen seconds the cauterization actually begins, with charring of the tissue. Carried on for more than twenty-five or thirty seconds, the cauterization becomes marked, and the tissue cauterized adheres to the end of the electrode. If carried on for longer than that, difficulty arises through fairly large masses of tissue sticking to the electrode. Papillomata, even of considerable size, can be completely destroyed in a reasonable number of sittings.

Of the cases so far reported there has been no mortality. One case of sudden death a few days after the treatment is reported by Beer; but the patient suffered from cardiac disease, and the treatment does not appear to have caused death. In suprapubic operations hæmorrhage, sepsis, and post-operative pneumonia occasionally occur, although with diminishing frequency, thanks to improved technique. In high-frequency cauterization there appears to be no danger of any complication except hæmorrhage. In the majority of cases this is too slight to be of importance. One case of severe hæmorrhage is reported by Keyes, and the author has had one case of bleeding for ten hours. The discouraging feature of operation for papilloma is the tendency to recurrence, or to the development of fresh tumours in other parts of the bladder. The percentage of recurrence, according to Kahn, is 26. In papillomata treated by high-frequency cauterization, the period of less than three years during which this method has been under trial is too short to give convincing statistics. In 15 cases recorded by Beer, Keyes, and Buerger, only one was known to have relapsed. "The majority of these cases have been followed for more than six months." In 6 cases treated in the Mayo clinic where a year or more had elapsed, none had recurred.

Calculus.—An important article by Madden[8] deals with the incidence of *stone in Egypt*. A popular fallacy, he says, is current, that Egyptian stones are always phosphatic, and therefore soft and friable and easily crushed, and that they are all secondary to bilharziasis. In the author's first 100 cases of operation for stone, although 60 contained phosphates among other constituents, there were only 10 purely phosphatic calculi in the whole series. The majority of stones met with in Egypt have a nucleus of uric acid or oxalate of lime, and are originally formed in acid urine. Later the urine becomes alkaline, and phosphates are deposited on the nucleus. Some of the nuclei contain bilharzia ova, which were probably lying originally in a broken piece of bilharzial papilloma; and in the earlier stage of bilharziasis there is no reason why the urine should not remain acid, and the resulting stone be entirely uric acid or oxalate. The incidence of stone and that of bilharzia are to some extent independent of each other, the latter increasing in frequency, while the stone cases remain stationary. The vegetarian habits of the fellaheen probably contribute very largely to the formation of stone.

Stone in the kidney forms a very small proportion of cases (1·6 per cent in 312 cases), and stone in the ureter is very rare. In stone in the bladder it is quite rare to find the bladder healthy, and in most cases the classical symptoms of stone are masked by those of bilharziasis. The operation mortality for stone in the male bladder was 7·8 per cent in 204 cases; the septic condition of the whole urinary tract in these cases makes it surprising that the mortality is not larger. "**Lithotrity** must always be the operation of choice for stone in the bladder in Egypt." It is the most satisfactory method, and there is less risk of further septic infection. It is unsuitable for children, and may be contraindicated by extensive bilharzial lesions of the urethra. A thick bladder tightly contracted on a large stone necessitates **Suprapubic Lithotomy.** There were 6 deaths in the series of 204 lithotrities. In 53 cases of perineal lithotomy there were 4 deaths, and in 28 cases of suprapubic lithotomy there were 6 deaths.

Arthur T. Cabot's[9] opinion is that **Litholapaxy** is the operation of choice for the removal of most stones in the bladder. It is surprising to find the operation imperfectly understood and little practised among the younger generation of surgeons. Litholapaxy has a mortality of from 1·6 to 6 per cent, and suprapubic lithotomy a mortality of from 10 to 20 per cent. The convalescence after suprapubic lithotomy is more painful, and from four to ten times as long as after litholapaxy. Litholapaxy interferes less with the function of the bladder, and in the author's experience of 210 cases of stone removal, there has been more tendency to recurrence after suprapubic cystotomy than after litholapaxy. Before the introduction of the cystoscope, unsuspected conditions might sometimes be found on opening the bladder suprapubically, but this statement no longer holds good. The reason why many surgeons continue to practise suprapubic lithotomy in uncomplicated cases is, according to the author, that they do not possess the necessary instruments and have never taken the trouble to learn the technique of litholapaxy. The author had performed litholapaxy in 185 cases, with a mortality of 4·3 per cent, and the whole of the fatal cases could not be attributed to the operation. In cases of prostatic enlargement with secondary stone, the obstruction should be removed and the stone with it; these cases were not now subjected to litholapaxy.

In the discussion on this subject at the American Medical Association, William E. Lower advocated the use of suprapubic cystotomy for all cases of vesical calculus. He pointed to the improvement in the records of suprapubic operations. "The opportunities for any one person in this country to acquire a large experience with the lithotrite within any reasonable time are very limited." Stones might be too large or multiple, might be encysted or adherent, or the patient might be very young; and the suprapubic operation was necessary in all these cases. In prostatic hypertrophy in old men litholapaxy is contraindicated. The length of convalescence in suprapubic operation is reduced by suture of the bladder.

Cassendet[10] of Jerusalem, relates his experience in closure of the bladder after suprapubic lithotomy in children. In eight years he performed suprapubic lithotomy in 40 children under ten years. In 21 cases the bladder was closed, and in 19 drainage was adopted. Of the 21 cases where the bladder was closed, only 11 healed completely, so that it was safe to allow them to go home fourteen days after the operation. Of the remaining 10 cases, leakage occurred without other complications in 7, so that the wound did not heal for twelve days longer. In 3 there were serious general symptoms before the wound broke down and the urine escaped. In the 19 cases treated by draining, the average duration of healing was forty-five days, and in 2, secondary stitching of the bladder was necessary. The author avoids closure of the bladder:—(1) In children in good general condition, where there is pronounced bladder irritation not relieved by some days in bed; (2) In children in poor general condition, and where there is a raised temperature or other signs of pyelitis; (3) In children where the bladder mucous membrane has lost its elasticity, and the stitches cut out very easily.

Rupture.—Schlecker[11] discusses the question of uræmia in intraperitoneal rupture of the bladder. If the urine escapes into the peritoneal cavity, the fate of the patient depends first on whether the urine was sterile or infected. If there has been cystitis, or if infection is carried by a careless passage of a catheter, the peritoneum becomes infected, and the prognosis is bad. It is laid down as a rule that when there is a suspicion that the bladder may have been ruptured, a catheter should only be passed for diagnosis where it is possible to proceed at once to laparotomy. Usually the symptoms following intraperitoneal rupture of the bladder are those of infection rather than of uræmia. The author records two cases where the symptoms of uræmia completely dominated the clinical picture. When this occurs, he recommends **Intravenous Saline Infusion,** after operation for the closure of the rupture has been performed.

Dysuria in Women. (*See also* URINARY INCONTINENCE IN WOMEN.) —David Newman[12] draws attention to certain urinary conditions in women, associated with frequent or painful micturition, which require careful examination with the cystoscope for their diagnosis. These are as follows: (1) Cystitis of pregnancy and its results; (2) Early renal tuberculosis; (3) Early tuberculosis at the base of the bladder; (4) Lesions at the neck of the bladder, the trigone, and the urethra; (5) Polyps of the urethra; (6) Movable kidney. In the cystitis of pregnancy the symptoms may not be very severe at first, and are attributed by the patients to the pregnancy; after this is over they are liable to suffer from bladder irritation, and the disease becomes chronic. The cystoscopic appearances may be very slight considering the amount of pain and irritation—merely patchy congestion, without thickening of the mucous membrane. Usually, however, the mucous membrane is congested, and covered with thin flakes of mucopurulent material. Urethritis is a frequent complication. In early renal tuberculosis there is frequent micturition without pain; later there is vesical irritability with pain and sudden vesical spasm when the bladder has been distended to a certain degree. The author draws the following conclusions from his personal experience of cystoscopy in these cases: When one ureteric orifice is altered, and the other normal, the renal lesion is on the side of the morbid ureter; the deformity of the orifice and the lesion there indicate the nature of the renal disease; the character of the urine escaping from the ureter denotes the morbid changes in the kidney; the frequency, size, and regularity of the shoots from the two orifices indicate the functional activity, or the presence of undue irritation, in the respective kidneys; when the orifice of the ureter is strictly normal, no serious disease exists in the corresponding kidney; when the kidney is normal the orifice of the ureter is also normal; when there is evidence of tuberculosis at the orifice of the ureter, there is always associated with it tuberculosis of the corresponding kidney; in tuberculosis of the bladder the ureter does not become involved if the corresponding kidney is free from disease.

There is a common form of irritable bladder associated with frequent micturition during the day, and occasional or persistent incontinence at night. The urine is highly acid, and contains mucus, epithelium, and *B. coli*; cystoscopy often shows a congested neck and slight hyperæmia of the mucous membrane.

Exclusion of the Bladder.—Charles H. Mayo[13] reviews the literature on this operation, one which has been slowly accepted by the medical profession, partly owing to a high mortality in the earlier methods, and partly to sentimental conservatism which urged the preservation of the bladder at any cost regardless of control or comfort. To determine the best method of disposal of the secretion of the kidneys in individuals in whom it is necessary or expedient to exclude the bladder is still one of the serious problems of surgery. To say, however, that the modern operation exposes the patient to greater danger from infection than is compensated for by the mitigation of his suffering, together with the natural mortality of the disease, is not consistent with the history of recent records of such cases. Unfortunately many patients already suffer from secondary infective complications before operation is advised. The operation is indicated for: (1) Patients with congenital anomalies of the bladder or urethra in which control of the urine cannot be restored, or painful sequelæ cannot otherwise be relieved. (2) Those in whom portions of the ureter are necessarily or accidentally injured or removed during abdominal, pelvic, or sacral operations. (3) Those in whom malignant disease of the bladder is too extensive to permit removal by partial resection while preserving the power of retention of urine; and similar cases, or other diseases of the bladder, where the power of retention and control add to the suffering.

The various procedures adopted for dealing with the ureters after extirpation of the bladder, especially in the treatment of ectopia vesicæ, are reviewed by D. Taddei.[11] He describes an operation which he has carried out on dogs, by which the cæcum is used as a reservoir for the diverted urine. No changes were found in the epithelium of the cæcal mucous membrane after a slight initial hyperæmia.

Contracture of the Neck of the Bladder.—Chetwood[12] says: "Whatever other cause may exist for the condition of vesical retention outside of prostatic enlargement and lesions of the central nervous system, there certainly does exist one in the nature of circular, sphincteric, and prostatic stenosis, causing incomplete and complete retention of urine. This appears in the young as well as in the old, may occur independent of prostatic enlargement or be combined with it, is sometimes a fibroid stenosis, being mostly inflammatory, may be confined entirely to the internal sphincter or encroach on the prostatic orifice and include a large portion of this section of the urethra, and is amenable to surgical relief by complete incision, preferably galvanocaustic, or by complete extirpation." The author records the case of a man, 36 years old, who gradually developed complete retention. There was no prostatic enlargement. The bladder had been opened suprapubically, and contraction of the urethral orifice found which was impassable to the examining finger. Post mortem it was discovered that the internal meatus was contracted to the size of a number 18 French catheter, and was exceedingly rigid. Microscopically the condition was one of chronic and acute perifollicular inflammation.

Simple Solitary Ulcer.—Buerger[13] formulates the following conclusions: Clinical, cystoscopic, and pathological studies in two cases have shown conclusively that simple callous ulcer of the bladder can and does exist. The symptoms are intense dysuria, urgency, frequency of micturition, hæmaturia, and pyuria. Chronic cystitis and contracted bladder are often the outcome. The region of the trigone is the favourite site of ulceration, and other superficial erosions may be present elsewhere in the bladder. In all cases of vesical hæmaturia a careful search should be made for the presence of a simple solitary ulcer; bleeding ulcers may be overlooked if we fail to bring every portion of the superior and posterior walls of the bladder into view. In the treatment of this condition (as well as in the treatment of tuberculous ulcer after nephrectomy), the **Fulguration** method should be tried; and if this fails, **Mercurial** injection should be given in cases of simple ulcer of the superficial variety. More recent clinical observations have shown that there is a type of simple ulcer of the bladder which may be termed chronic and callous. Such ulcers should be **Excised** with the punch forceps through the operating cystoscope.

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BLASTOMYCOSIS.

Herbert French, M.D., F.R.C.P.

Prior to the publication of the classical studies of Schenck and Smith in 1898, the cutaneous lesions of sporotrichosis were usually ascribed to syphilis, tuberculosis, or coccic cellulitis, and even to-day the true nature of the condition is often not recognized. Blastomycotic dermatitis seldom simulates either sporotrichosis or syphilis, although its resemblance to tuberculosis verrucosus cutis is often so close as to require cultural differentiation. Occasionally, however, even syphilitic ulcers may be simulated so nearly that the need for cultures being taken may not strike the observer. This is illustrated by some cases recorded recently by Sutton.[1] The diagnosis was confirmed by the detection of the blastomyces, whilst the Wassermann reaction was negative.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1913, i, 115.

BLOOD, EXAMINATION OF.

O. C. Gruner, M.D.

Cytology.—Remarks on the origin of *blood platelets* in relation to the study of the red corpuscles are given by Brockbank,[1] whose views are well known. Using pepsin solution, he shows that under its influence hæmoglobin goes into solution and then leaves the red cell, indicating the existence of a structureless protecting material enclosing the true envelope, which in its turn has linked to it the blood pigment; while the material known as a blood platelet exists in a cavity in the interior of the cell. The best review of the whole subject is to be found in a paper by Schilling-Torgau.[2]

Fragility of the red corpuscles is discussed by Butler[3] in full. The work is mainly confirmatory of that of others. The fragility is decreased in obstructive jaundice, pneumonia, and chronic tubular nephritis, whereas it is increased in congenital jaundice and cyanosed states. It is normal in scarlet fever, cancer, syphilis, pernicious anæmia, purpura, malaria, etc.

The *coagulation time* has been the subject of study by Lee and White,[4] who use blood drawn from an arm vein with a syringe. The advantages claimed are that the material does not come in contact with either tissue or skin, so that absolutely pure blood is obtained. It is doubtful whether the apparently simple procedure is justified as a routine one, although these authors claim that it does no harm to the vein. The paper gives a list of the conditions under which the coagulation time varies. Another coagulometer of rather complicated form is described by Dorrance.[5]

The diagnostic significance of *blood counts* in various diseases is discussed by a number of authors. Smith[6] finds that the white cell counts in pelvic suppuration are extremely variable. If the leucocytosis reaches 14,000 there is likely to be trouble during convalescence.

Fiske[7] shows that there is no leucocytosis in bone tuberculosis in children. If such is noted in the blood it points to some other focus of infection. The tendency is for the total count to be less than 12,000 in tuberculous cases and over 18,000 in osteomyelitis.

Ward[8] describes small giant "cells" in the blood of cases of cancer in which metastases have occurred in the bone. They are about four times the diameter of the red blood-cell.

The Arneth count has been studied in tuberculosis of the lungs by Klinger[9] and Kayevsky.[10] The latter made a careful study of the various constituents of the differential count, and found that the eosinophiles were increased except in advanced cases. As regards lymphocytes, he found that, taking both small and large ones together, they ran distinctly parallel with the total nuclei in the Arneth count and were inversely proportional to the total leucocyte count. An increase in the transitional cells appeared to indicate an increased activity of the tuberculous disease. Klinger used the Arneth count for purposes of prognosis. In most cases it would indicate the patient's resisting power, but the method cannot be blindly relied upon.

Lymphocytosis, according to Decker,[11] is a persistent feature of the blood of children suffering from acetonæmia in attacks related to digestive disturbance.

Veraguth and Seyderhelm[12] report the very rapid changes in the blood count produced by the influence of weak electric currents passing through the body.

Hazen[13] gives an exhaustive study of the leucocytes in syphilis. The main feature about the blood is the increase of lymphocytes in secondary syphilis under the influence of treatment. In untreated cases they are apt to be increased in negroes and females. The higher the count the better will be the effect of treatment. This increase of lymphocytes is shown also in cases of papular eruption. Should there be a skin eruption with eosinophilia, the diagnosis of syphilis may be excluded.

CHEMISTRY.—A handy means of estimating the amount of *sugar* in the blood is given by Bang.[11] Little pieces of blotting-paper, 16 by 28 mm., are cut out and used to soak up blood taken from the ear before breakfast, until the paper is quite saturated. This is then placed in a test-tube, and into it are poured 5 c.c. of boiling salt solution (130 c.c. saturated potassium chloride; 64 c.c. water, ·15 c.c. of 25 per cent hydrochloric acid). In half an hour the fluid is poured off into a tube, and 5 drops of Fehling No. 2 and 2 drops of Fehling No. 1 are added. After boiling for half a minute, a precipitate is looked for within two minutes; if found, it proves an excess of sugar in the blood. This may be noted in cases of kidney disease, supposing that there is inadequate excretion of sodium chloride or nitrogen.

The significance of *cholesterin* is discussed by Weltmann.[15] A method for its estimation is given, wherein the colour is collected by chloroform and roughly determined by comparison with a Fleischl hæmometer. The ratio between the reading on the scale and parts per thousand of cholesterin has been worked out on a table affording a very convenient method of estimation. The amount is increased in arterial and kidney disease, sometimes in liver disease. It is increased in syphilitic nervous disease; diminished in tumours associated with cachexia, and in active tuberculous disease.

Ferments.—(1) *Peptid-splitting.*—Smithies[16] finds that when aseptically obtained fresh blood-serum is combined with a solution of glycyl-tryptophan (Fischer) and incubated under toluol at 37° C. for twenty-four hours, on acidulation with 3 per cent acetic acid, typical rose-pink to violet colour changes occur on the admixture of bromine vapour. (2) *Glycogenic.* 2 c.c. of blood are collected into a vessel containing 10 c.c. of glycogen solution (1·5 per cent). The mixture is clarified by means of two or three drops of soda, incubated for half an hour at 37° C., and two volumes of potassium sulphocyanide are added carefully. This makes the mixture limpid enough to read in a polarimeter tube; the rotary power is then estimated. Glycogen is + 196, while sugar is — 52. Ghedini[17] found this estimation of value in the study of liver disease. A diminution of rotary power indicates its presence. This is more marked in chronic hepatitis, cholelithiasis, and catarrhal jaundice.

The amount of *iron* in the blood was found to be in excess of that which is combined with hæmoglobin, to an extent bearing a ratio to the total amount of iron. According to observations by Fowell,[18] the finding of special interest is that the ratio between the two forms of iron is raised to nearly two to one in cases of pernicious anæmia. It is normal in cirrhosis of the liver. The method employed is a modification of Jolles'.

Opsonic Index.—A strong advocate of opsonic work in cases of tuberculosis is found in Staveley Dick,[19] who claims that the average obtained by counting 100 cells is very close to the absolute average. He advocates the use of heated serum (55° to 60°) for ten or fifteen minutes. Most unheated serum makes several determinations necessary. There is no fixed relation between the improvement of the patient under the influence of tuberculin and the amount of opsonin in the blood. The use of the index lies in indicating the amount of exertion the patient may undertake, and as a guide to the dosage.

SEROLOGY.—*Dialysis test of Abderhalden* (see also PREGNANCY, DIAGNOSIS OF).—This has been discussed by a very large number of authors, and its application to the various sections of clinical pathology appears to be considerably extended. While it is of special service in the diagnosis of pregnancy, it was quickly applied to the detection of carcinoma, of disturbances in the thyroid and kidney, of diabetes, and of various forms of insanity. Indeed, the process appears to present possibilities of detecting the existence of specific immune substances of wide range, and so opens up extensive fields of research. The following writers may be referred to: Frank, Rosenthal, and Biberstein,[20] Lampé and Papazolu,[21] Lampé and Fuchs,[22] Abderhalden and Schiff,[23] and Kabanow.[24] On the other hand, it appears that the Abderhalden tests are not directly related to the specific immune bodies which appear after parenteral introduction of protein into the organism. Frank and Rosenthal proved that some of the proteolytic ferments which appear in the circulation after parenteral administration of proteins are of non-specific character, while others may be intensely specific, the explanation of the paradox being that the method of treatment of the organism during the process of sensitizing it may determine the appearance in the circulation of a whole gamut of ferments of specific and non-specific nature.

The theory of the reaction is as follows. The cells of the body break down the products of their metabolism so far that only simple substances appear in the blood-stream. If the breaking down is disturbed, so that more complex derivatives of protein, or cells themselves are allowed to enter the circulation, the organism reacts by forming specific ferments which can break down this foreign material. The essential support of this hypothesis was the discovery that in pregnancy there was a ferment in the blood which could break down placental protein. Perhaps the greatest prominence has been given to the subject in connection with the diagnosis of carcinoma.

The *method* employed for detection of the ferment action consists of two parts: (1) The so-called *optical* method, where the rotatory power of the blood-serum becomes altered; and (2) The *dialysis* test, which depends on the detection of dialysable products. In this latter[25] well-washed pieces of organ are boiled for five minutes in water to which a trace of acetic acid has been added. The tissue is wrung out, placed in more water, and boiled in the same way. The filtrate is tested for, either by the biuret test or the ninhydrin reaction. If either of these be negative, the organ is ready for use, and may be preserved in sterilized water treated with chloroform and covered with toluol. Into a dialysis thimble No. 579A of Schleicher and Schüll, place 1·5 c.c. of the serum to be tested and 1 gram of the organ cut up into pieces the size of a pea. Suspend into an Erlenmeyer flask containing 20 c.c. of water, and cover both layers of fluid with toluol. After incubating sixteen hours divide the dialysate into two parts. To 10 c.c. of the first add 2·5 c.c. of 33 per cent soda, and float ·5 c.c. of very dilute copper sulphate solution upon that mixture. A violet ring will appear at the junction line if the biuret test is positive. To 10 c.c. of the second, add ·2 c.c. of 1 per cent aqueous ninhydrin.* Boil exactly one minute. A blue colour indicates the existence of dialysable break down products of protein. The following precautions should be observed: (1) Make a control without a piece of organ; (2) The washing of the organs must be very precise; (3) In using extracts of cancer tissue a very cellular subserate is advisable; (4) The dialysing thimbles must be tested to make sure they are impervious to protein and pervious to peptone.

Epstein[25] gives a modification of the test as used in Freund's laboratory. Five c.c. of the dialysate above named are treated with ·5 c.c. of 20 per cent soda and 2 c.c. of 10 per cent aqueous solution of the classical mixture of Fehling's solutions A and B. Epstein shakes the mixture afterwards to observe a violet colour, in preference to applying the ring test. He tested the serum of patients affected with *cancer* against cancer proteid and placental proteid, and found that in practically every case there is a failure to attack both kinds of proteid simultaneously. Similarly, seventeen out of eighteen pregnant women gave a serum which attacked placental proteid and not cancer proteid, and every one of forty seven cases which were certainly free from cancer failed to give a reaction.

Rather more extensive observations were made by Deutsch and Kohler.[26] The reaction for *pregnancy* was found positive, whether the gestation was in or outside the uterus. This conclusion was also arrived at by the use of the "optical method" by Tschudnowsky."[27] The alteration in pregnancy at the third month came to about 0·14, which is the value of the change of polarization.

There are certain resemblances between carcinoma and pregnancy in the direction of their serum reactions. Julchiero, of Turin,[28] collected the following data: first, that in each the blood-serum contains greater anti-tryptic power, and second, that the urine contains an increased amount of oxyproteid nitrogen and of polypeptid nitrogen. The blood-serum gives no carcinolytic properties in either, but gives a positive Calmette's activation reaction for cobra venom with the inactivated blood-serum. This author used the meiostagmine reaction for his work, finding that the number of drops that passed through the instrument over and above water at 18° was ·8 to 2·1 for pregnancy, whereas it never exceeded ·6 for any other condition. It was found that menstruation does not interfere with the positive reaction for pregnancy. Seventeen out of twenty-two cases of nephritis had the power of breaking down renal tissue. Persons with orthostatic albuminuria failed to give such a reaction. Serum in a case of uræmia gave an intense reaction with renal tissue, whilst cerebrospinal fluid failed to give any reaction with it.

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* The trade name of the Höchst chemical works for triketohydrindene-hydrate.

Kabanow employed the method for determining the existence of *diseases in the alimentary tract*, such as gastric and duodenal ulcer. For this purpose the mucous membrane of the parts is utilized, and it was found that an enormous loss of material occurred during the stages of washing and pouring off the wash-water. It was found advisable to centrifuge before pouring it off. Another interesting finding in this work is that in pernicious anæmia the small intestine gives a positive reaction, and indeed the position of an intestinal lesion may be determined by testing out the serum against each particular part of the alimentary tract. In this way the test becomes applicable to the detection of appendicitis, colitis, enteritis, duodenal ulcer, etc.

The work of Lampé and his associates has been directed to the study of reaction in cases of *exophthalmic goitre*, and the interesting observation has been made that a positive reaction is obtained, not only with the normal thyroid extract, but with the ovary, placenta, and occasionally the thymus gland. This seems to show how valuable the work would be for determining the existence of derangement of the internal secretions in the different obscure conditions to which recent literature suggests their causal relation. It is a matter of theoretical interest to state that the method was employed to demonstrate the fact of dysthyroidism in Graves's disease, although that was already determinable by micro-mechanical study of tissues. The author suggests that a similar process is taking place in the thymus gland.

Fauser, quoted by Mayer, applied the test to the domain of *mental diseases*, and found that in most cases of dementia præcox there were ferments formed which acted against extracts of the pituitary gland and cerebral cortex. These ferments disappear in the terminal stages of the disease. Such ferments never appear at all in functional psychoses, so that here we have a test which promises to be very important. The observations were based on 250 patients, and are supported by Wegener, Fischer and Kanner, and Neue. A number of other observers do not get exactly the same results, but here, as in the test as applied to the examination of cancer cases, it is essential to recognize that absolute chemical purity must be followed in order to get reliable actions. The thimbles must be repeatedly tested for permeability towards peptone and egg albumen. All the blood must be removed from the organs, and controls of distilled water must be used. In dementia præcox there is always a ferment present against testis or ovary, almost always one for cerebral cortex and for thyroid gland. There was no serological reaction in any cases of maniacal depressive insanity. In a case of general paralysis the serum always reacted positively with cerebral cortex. Two-thirds of the cases of dementia were positive to testis and thyroid. They all gave a strongly positive reaction with liver extract. The cerebrospinal fluid entirely failed to give any reaction. Urstein discusses the question whether catatonia is to be connected with failure of the reproductive organs to secrete.

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BLOOD-PRESSURE. (*See also* ARTERIOSCLEROSIS, NEPHRITIS.)

Carey Coombs, M.D., M.R.C.P.

Balard's[1] researches into the *arterial pressure during infancy*, conducted with the Pachon oscillometer, yield little of direct value to the practitioner; but it may be worth while to know that at birth it lies between 35 and 55 mm. Hg, rising steadily with increasing age, and in parallel, i.e., the maximal and minimal pressures both rise by equal increments, the pulse-pressure (the difference between maximal and minimal) remaining constant.

Pachon[2] finds that, using his oscillometer, the minimal or *diastolic pressure* is of more importance than the maximal or systolic pressure, and that it ought to be regarded as the standard of arterial tension, for the following reasons. It is more constant in the same individual than the maximal pressure; this latter represents a brief moment only in the pulse wave; the minimal pressure expresses the permanent "charge" of blood which the artery has to carry, as well as the peripheral resistance which the heart has to overcome at the outset of ventricular systole.

Janeway[3] found, by investigation of cases of hypertension seen in private practice, that the commonest terminal events were cardiac failure and uræmia, which occurred in approximately equal proportions. The average duration from the time when the patient was first seen to the date of death was between three and four years. These observations apply to persons whose systolic pressure reached or passed 170 mm. Only fourteen out of a hundred cases ended in cerebral hæmorrhage. His chief deductions from this study show that the early occurrence of dyspnœa, whether on effort or of the paroxysmal type, in a patient with high blood-pressure, indicates marked danger of cardiac insufficiency. Such patients must be treated as suffering from a cardiac disease, especially by safeguarding methods. Anginoid pain, even when of marked severity, occurring on exertion in persons with high blood-pressure, does not make the prognosis worse than do other cardiac symptoms. Of course, every precaution must be taken to prevent over-exertion. The majority of these patients will not die in an anginal paroxysm. Complaint of polyuria, nocturnal frequency, marked headache, or of visual disturbances, by a patient with high blood-pressure, especially if that patient be below fifty, should make the prognosis very guarded, for uræmia is a frequent mode of termination in such cases.

TREATMENT.—Dawson[4] says that much more might be done to check hyperpiesis if patients made periodical visits to the doctor to be overhauled, whether they felt symptoms or no. When it has been determined, by more than one observation, that the pressure is pathologically high, the cause must be looked for; and Smith[5] says it is improper to exclude renal disease until the new functional tests have been applied (see RENAL EFFICIENCY). According to this writer, continued **Rest** in bed is indicated when the earlier evidences of cardiac embarrassment begin to be manifest; but all hyperpietic subjects will benefit by a regular daily nap after the midday meal, for the pressure falls during sleep. Cold baths should be forbidden. The development of any acute infection—bronchitis, tonsillitis, or even a "common cold"—in a patient with high blood-pressure cannot be considered a trivial affair, for an acute nephritis is not an infrequent result. These patients should be put to bed and carefully watched.

As Mantle[6] and others point out, it is essential to realize that hypertension is often necessary to the maintenance of an effective blood-supply to the various organs, and that our therapeutic attack should be made upon the cause. To lower the average pressure by active means may do actual harm. At the same time, anything in the diet or habit of life which has a pressure effect should be stopped, or at any rate limited. Martinet and Heckel[7] believe that "most cardiorenal patients eat a great deal, a great deal too much, and drink still more." They bring forward observations to prove that benefit accrues from **Restriction of the Fluid Intake**. The total daily diet must not include as much as three pints of water in the twenty-four hours. They regard unrestricted ingestion of fluid as productive of much harm in persons with high tension.

Allusion is made elsewhere (see X-RAY THERAPEUTICS) to a new method of treatment of which Rostaine[8] speaks highly. This consists of **X-Ray Applications** to that part of the back which corresponds to the suprarenal glands; it is based on the "adrenalinæmia" hypothesis, which attributes high pressure to excessive outpouring of pressor substances from over-active suprarenals into the circulation. Rostaine says that this treatment reduced high pressures which were associated with arterial sclerosis. Many sittings may be necessary.

REFERENCES.—[1]Brit. Med. Jour. 1913, May 3; [2]Practitioner 1913, [illegible]; [3]Jour. Amer. Med. Assoc. 1913, ii, [illegible]; [4]Lancet 1913, i, [illegible]; [5]Med. Rec. 1913, i, [illegible]; [6]Lancet 1913, i, [illegible]; [7]Presse Méd. 1913, [illegible]; [8]Med. Press and Circ. 1913, i, [illegible].

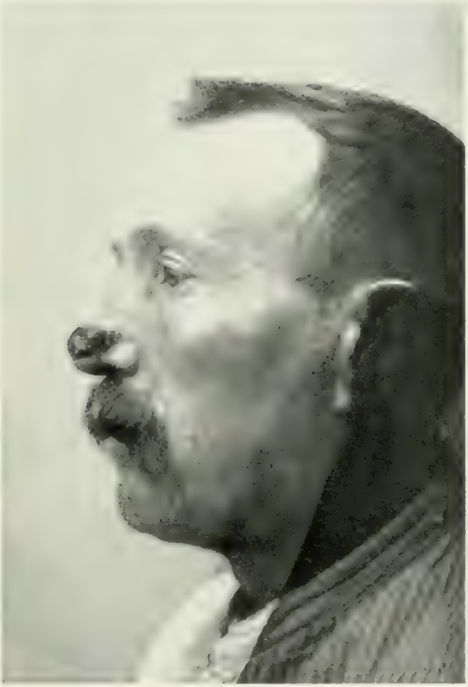
BOTRYOMYCOSIS.

Herbert French, M.D., F.R.C.P.

The pathology of botryomycosis or telangiectatic granuloma is still undecided. An illustration of this condition affecting and destroying a finger was given in the last volume of the MEDICAL ANNUAL; *Plate V* depicts a similar lesion of the same from a paper by

PLATE V.

BOTRYOMYCOSIS



[illegible]

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Konjetzny.[1] He regards the cocci which may be found in the tumours as entirely accidental, and considers the tumours themselves to be nævoid: that is, nævi that have been latent, suddenly taking on proliferating powers which lead to destruction of the surrounding tissues but no true malignancy

REFERENCE.—[1] *Münch. med. Woch.* 1912, 2210.

BRAIN, ABSCESS OF. [*See also* AMŒBIASIS, *and* OTITIS MEDIA.]

Geo. L. Richards, M.D.

Berens,[1] from his study of 50 cases of *frontal lobe abscess*, finds the most constant localizing symptom is hemiplegia. In one case this was due to the extension of subdural abscess over to the motor area; in others, either to the abscess involving the internal capsule, to the accompanying encephalitis spreading to the internal capsule, or to pressure of the abscess upon the motor area.

REFERENCE.—[1] *Ann. Otol.* 1913, June.

BRAIN, SURGERY OF.

E. W. Hey Groves, M.S., F.R.C.S.

In the first place among all the contributions to this subject during the past year must be placed the great discussion at the 17th International Congress[1] on the treatment of cerebral tumours. The most striking impressions left on the mind by this debate were: the enormous activity at present being displayed in this field of surgery, Bruns, Tooth, v. Eiselsberg, Krause, and Cushing each speaking of hundreds of recent cases; the pessimism engendered in the minds of expert onlookers like Tooth, by the attempts at radical removal of malignant tumours, so that he seemed to advocate the doing of less, rather than of more, in the direction of thorough operations; and Cushing's plea for more careful and slower operations.

Bruns,[1] in opening the discussion, spoke first about the limitations of the term "tumour." Both gummata and tubercle masses were often to be regarded as such, but the possibility of the disease being syphilitic ought always to be borne in mind, and a thorough course of iodides given before resorting to operative measures. But even if some improvement did take place under this régime, gummata of the motor cortex, by their tendency to scar-formation, would usually require surgical removal.

In the choice between merely palliative and radical operations for cerebral tumour, he said that the goal of all surgical effort should be towards removal of brain growths, and that decompression operations should be reserved for those cases where localization was impossible or the tumour surgically inaccessible. However, at present the prospect of success in radical operations is a matter of grave uncertainty, depending chiefly on three factors: (1) The pathological nature of the tumour; (2) The accuracy of diagnosis of the presence and localization of a tumour; and (3) The accessibility of the tumour to surgical approach. As regards the first factor, glioma, fibroma, and endothelioma are usually single, slow-growing, with no tendency to dissemination. The gliomata are generally ill defined and infiltrating, whilst the sarcomata are always so. Tubercles and gummata are frequently multiple, and by no means so favourable for removal as might be imagined. In the case of tubercle masses, there is great danger of the operative interference setting up tuberculous meningitis, whilst with gummata there is often associated a syphilitic disease of the cerebral vessels which is not to be cured by a removal of the tumour. The method of Neisser and Pollack was mentioned without any expression of opinion as to its value. By this procedure a small piece of the tumour is removed through a small drill opening in the skull, and from this two facts may be established: (1) The nature of the growth, and (2) Its depth from the surface.

Accurate localization of the tumour, as a general rule can be accomplished with any confidence only in the motor area, pons, cerebellum, and hypophysis. Within recent years Bruns has found that in between 70 and 80 per cent of all cases an accurate local diagnosis was possible.

In speaking of the *prospects of radical operation* and their ultimate success, he summed up by saying that in 100 of his own cases only 30 were found to be open to radical attack, and of those about 3 or 4 gave lasting cures. If the operative attack was to be limited to a decompression, this should always include a free incision of the dura mater.

Tooth's communication[1] comprised what is probably the most valuable and complete analysis of the results of operative treatment of cerebral tumours that has ever been published. This was derived from the 407 cases observed at the National Hospital, Queen's Square, during the past 10 years. In presenting the table on opposite page, compiled from Tooth's statistics, it is necessary to quote his accompanying remarks: "It cannot be too strongly urged that this table must not be taken on its face value, but must be judged only after consideration of the circumstances of all the cases from which it is constructed. Among the cases which ultimately died of recurrence are many positive surgical successes, some almost brilliant, considering the circumstances, and followed by relief of pain, improvement in sight and mental state, and prolongation of life."

In tumours of the frontal region, it is remarked that only one case of glioma was known to be alive and well some time later. Of the patients with endotheliomata of this region, 40 per cent died as the result of operation, a result due to the large size and great vascularity of these growths, but those surviving the operation made a lasting recovery.

In tumours of the central or motor region, the low operative mortality is as notable as the large proportion of cases that come to operation. This is readily explained by the fact that their symptoms are so unmistakable that the diagnosis is made earlier and with more certainty than in any other region of the brain.

In 33 operations for cerebellar tumour, removal was possible in only 11, and of these only 4 survived for any length of time. In the case of tuberculous masses in the cerebellum, operation often proved fatal by setting up tuberculous meningitis. In the extra-cerebellar tumours, of 24 radical operations 13 died within one month and only 7 survived for any length of time. But with these cases the symptoms are so urgent and terrible that something must be done, and the results of the decompression operations were even worse than those of the radical, 8 out of 12 dying of the operation. As most of these extra-cerebellar tumours are of benign nature, these bad results seem the more to be deplored. It would seem that they arise from the effect of the sudden alteration of pressure upon the adjacent vital centres in the medulla.

LIST OF 497 CASES, SHOWING LOCALITY OF GROWTH, NUMBER OF CASES OPERATED UPON, NATURE OF OPERATIONS, FATALITIES AND ULTIMATE SUCCESSES.

Region.	All Cases.	All Operations.		Removal, partial or complete.			Exploratory.		Decompressive.	
		No.	Per cent.	No.	Fatal within 1 month.	Alive and well.	No.	Fatal within 1 month.	No.	Fatal within 1 month.
Frontal ..	96	70	73	51	9	13	17	5	22	7
Central ..	65	54	83	30	1	9	14	4	10	2
Temporal ..	47	30	64	7	1	4	14	1	9	5
Occipital ..	14	7	50	2	0	0	3	0	2	0
Corona radiata ..	13	6	46	1	1	0	2	1	3	1
Pituitary	14	4	28	4	1	0	—	—	—	—
Cerebellum ..	74	33	44	11	4	4	14	5	8	2
Extra-cerebellar ..	44	36	82	24	13	7	1	1	11	7
Pons	41	4	10	—	—	—	1	1	3	0
Lateral ventricle ..	3	2								
Optic thalamus ..	6	1								
Mesencephalon ..	26	7								
Pineal	4	4		1	1	0	7	7	10	5
Fourth ventricle ..	5	3								
Medulla	1	1								
Base	4	0								
Not localized ..	40	3	7	—	—	—	1	—	2	—
Totals ..	497	265	53	111	31	37	74	25	80	29

N.B.—The figures under the heading "Alive and well" include those cases which sent no reply to the most recent enquiry. Very much greater detail is given in the original article.

The general conclusions that Tooth comes to as the result of his careful survey of the subject may be summarized as follows: That operations for cerebral tumours have a high mortality, whoever is the operator and whatever the operation. This mortality is lowest in the central region and highest in the extra-cerebellar. The dangers are shock, cardiac or respiratory failure, which may come on suddenly as late as fourteen days after the operation, and sepsis. In considering the apparently successful cases. It is to be noted that survival often occurs without improvement even after radical treatment; but on the other hand, the palliative operation often relieves the symptoms, especially optic neuritis. As to the choice of operation, results would be much better if the malignant growths (i.e., carcinomata, sarcomata, and many gliomata) were left absolutely alone. Often an apparently successful operation on such a case seems to stir up an increased malignancy. If when the skull and dura have been opened freely, there is no tumour apparent to sight or touch, exploration of the brain is to be deprecated. It is remarkable what good results often occur after the first stage of a two-stage operation. This would suggest that it is always worth while to wait after this first stage until the improvement ceases, in order to give a longer time for readjustment of the brain to altered pressure conditions. In those urgent cases in which the symptoms all develop within six months, it is probably useless to attempt anything but a decompressive operation.

Fig. [illegible]

Oppenheim and Krause[2] give an account of the diagnosis and treatment of a small tumour of the vermiform process of the cerebellum which is a brilliant example of what is sometimes possible in this field. The tumour was about the size of a walnut, and after its removal, the floor of the fourth ventricle lay exposed to view. The patient, an unmarried woman of 30, made a good recovery and was cured of her symptoms.

Hudson[1] returns to the subject of the methods of attacking tumours and dealing with hæmorrhage of the brain. He relates a successful case in which he removed the clots from a man of 45 with apoplexy. The important principles to be observed, according to this author, in all cases where there is a great increase of intracranial pressure are:—(1) The making of such a large osteoplastic flap as to allow displacement of a large part of the brain in the relief of pressure, without forcing a part of the cortex into a small hole; (2) The cutting of the cranium by means of strong cutting forceps, which avoids the jarring and vibration that accompany the use of saws or chisels.

The same author[5] has devised a special technique for the treatment of *internal hydrocephalus* (*Fig.* 10). He exposes the right temporal fossa by splitting the muscle, and opens the skull by a burr; then the dura is opened and the ventricle punctured. A permanent drainage tube made of silver wire coil is inserted through the same track, and its outer end attached to a little radiating silver wire mat (*Fig.* 10, *a, b*) which is tucked into place under the muscle and the skin incision closed. Haynes[6] reviews the many methods which have been suggested from time to time for the relief of hydrocephalus, and adds yet another to the already formidable list. His proposal is to sew in a fine drainage tube as an anastomosing channel between the superior longitudinal sinus or occipital sinus and the cisterna magna. (*Fig.* 11.)

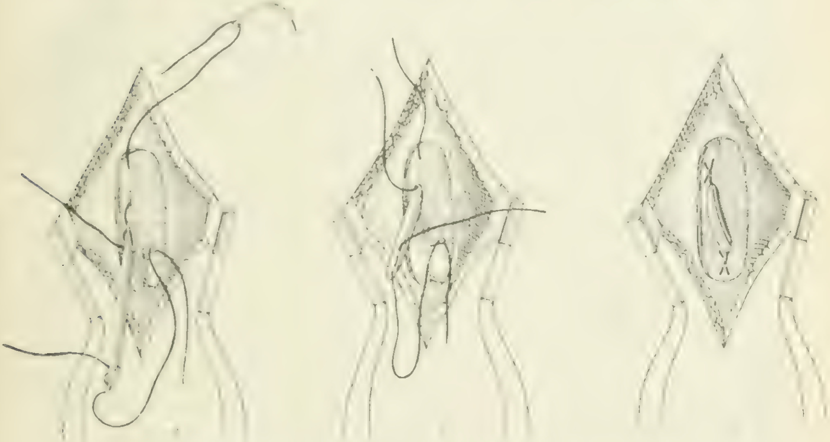


Fig. 11.—Haynes' operation [illegible] the cisterna magna [illegible] One end lies in the cisterna magna and the other in the longitudinal sinus. The bone detritus may be packed [illegible].

The Surgical Treatment of Epilepsy.—There is no subject in cerebral surgery more difficult than that of the prospect of relief of epilepsy by surgical means. From time to time some of the greatest of surgeons have declared that surgery can relieve even the idiopathic type, but this is distinctly contrary to the opinion of most. And there are not wanting those who doubt that surgery can do anything for even the Jacksonian epilepsy which follows trauma. The generality of the profession stand between these two extremes of optimism and pessimism. Therefore the careful work of Matthei,[7] in which he has collected and abstracted all the cases of traumatic epilepsy which are published, is to be welcomed as being a reliable guide both for treatment and prognosis. He considers that there are three distinct etiological factors in all cases of traumatic epilepsy, viz., hereditary predisposition, injury, and the inflammatory changes directly or indirectly due to the injury. His collected cases of epilepsy following trauma comprise 326, of which 266 were distinctly Jacksonian and 60 of general type.

The results of the operations in these cases were as follows:—

Cure or lasting betterment of over a year	96 = 29·5	per cent
Jacksonian	81 = 30·4	,,
General	15 = 25	,,
Bad result, death or aggravation	81 = 24·7	,,
Jacksonian	59 = 22·2	,,
General	22 = 36·6	,,
Cases observed longer than 5 years as well	24 = 7·4	,,
Jacksonian	21 = 7·9	,,
General	3 = 5	,,
Death resulted from the operation in	19 = 5·7	,,

The operation findings in most cases were nothing, and this was notably the fact in those where no relief was afforded. In less than half the number were found bone splinters, depression or thickening of the inner table, thickening and adhesions of the dura, and cysts of the arachnoid. In many cases where nothing was found, the convolutions associated with the chief convulsions were removed, with varying success. It is important that as a preliminary, the affected convolutions should be identified by means of electrical stimuli.

The chief factor in determining a successful result from the operation, is the definiteness of the gross change found under the skull. A definite gross lesion was found in 23 out of 24 of the lasting cures. The patients between twenty and thirty gave the largest proportion of successes. The final conclusions are that a more thorough prophylaxis of traumatic epilepsy ought to be pursued, by trephining all cases of cranial injury in which there was a likelihood of cortical injury; and that in cases where epilepsy has developed, the indications for operative attack are: failure of internal treatment, the directness of the relation of the epilepsy to the injury, and the Jacksonian type of the disease.

REFERENCES.—[1]*Reports of 17th Internat. Med. Congr. Sect.* vii, 1913; [2]*Ibid.* 202; [3]*Brit. Med. Jour.* 1913, ii, 322; [4]*Ann. Surg.* 1913, i, 402; [5]*Ibid.* 318; [6]*Ibid.* 440; [7]*Deut. Zeit. f. Chir.* 1913, cxxiii, 417.

BREAST, CANCER OF.

[illegible], M.D., F.R.C.S.

Those surgeons who follow closely the statistics of cure after operations for cancer, will have come to the conclusion that the more carefully these are compiled, and the longer the cases of supposed cure are traced, the less is the percentage of those remaining free from recurrence. The reasons for this are many. In the first place, there is the difficulty of diagnosis until the disease is far advanced; patients delay seeking advice, and in the case of the breast, in many text-books the signs given of cancer are not those of an early stage; but what is an early stage? The surgeon may find the axillary glands enlarged, though the original disease is a small nodule in the breast which could probably not be found at all by the patient, and only with difficulty by the surgeon. Even if the patient comes with an easily discoverable lump in the breast immediately on noticing it, there may be already advanced infection of the glands.

Spencer Brown[1] says his record of operations on cancer of the breast shows that the fight against cancer so far has been a losing one. His results may be less favourable than those of others, but they are honest. He has operated on 131 cases, and has traced the post-operative history in 85; there was recurrence in 6 cases within a year, in 46 within two years, in 22 within three years, and recurrence in 10 within five years; 1 patient was alive after fifteen years. These figures are very discouraging if we are only considering complete cure as the ultimate goal; but every day of life prolonged must be taken into account. He thinks that early diagnosis in a pathological sense is very rarely made, and that all cancers when operated on are really advanced. If the theory of Cohnheim, Ribbert, and Beard is correct, the small tumour represents a late rather than an early development. He thinks it is the resistance of the patient rather than the virulence of the cancer, which determines whether the patient shall succumb early or late.

Primrose,[2] of Toronto, thinks that a "quick" section of a suspected tumour in the theatre, if positive, is of the greatest importance; but if a negative is given as to its malignancy, it is of comparatively little import and may be misleading. He gives the particulars of 323 cases, of which 216 were malignant. He thinks practitioners wait too long for the obvious signs of malignancy (pain, involvement of the skin, retraction of the nipple, and easily palpable glands in the axilla) before sending the patient to the surgeon. The glands in the axilla are involved at a very early date, and no matter how early operation is done, it is rare for the pathologist not to find cancer in them. In his cases, enlarged glands were noted in 36 per cent, but these ought to be found more often clinically. From an enquiry, he found that in his own cases the disease had been noticed for a year in nearly 50 per cent.

Deaver,[3] of Philadelphia, reviews 534 operations on the mammary gland. The primary mortality is low, but the end cures are smaller than is generally thought. He concludes his article as follows: "Approximately, one patient in five is permanently relieved of the disease by the radical operation, though it must be confessed that the inability to secure reliable data makes even this percentage questionable. . . . When popular opinion demands immediate operation on the discovery of a lump in the breast, when physicians are taught to think of breast tumours in terms of operability, and when misguided humanitarianism no longer prompts the surgeon to attempt injudicious operations, the present lack of faith in the surgery of this disease will give way to a healthy optimism."

Lucas[4] reports a case in which he operated on a recurrent cancer in both breasts in a woman, aged 67, who died free from recurrence at the age of 82, fifteen years later. This illustrates the benefit which is derived from an extensive operation.

Halsted[5] has made some modifications in the incisions for removal of the cancerous breast. He now omits the triangular flap which covered up the axilla, as it sometimes sloughed. The cut down the arm is omitted, and often the vertical cut to the clavicle. Not infrequently the only incision of the skin is the circular one surrounding the tumour. The skin of the outer flap between the two vertical incisions is utilized primarily to cover the vessels of the axilla completely and redundantly without any tension whatever. The edge of the flap is stitched by interrupted buried sutures of very fine silk to the fascia just below the first rib, in such a way that the skin partly envelops the large vessels. The rest of the wound is covered with Thiersch skin grafts. The arm is abducted to 90 degrees or more during the stitching of the wound (*Plates VI, VII*). Movements of the arm as free as possible are encouraged after the second day. The advantages of skin grafts are as follows: An unlimited amount of skin can be removed; skin grafts present a definite obstacle to the dissemination of carcinomatous metastases; recurrences in the deeper planes may be promptly detected under the thin, grafted skin (these should be burnt away, down to the pleura if necessary, with the actual cautery); the inner or thoracic wall of the axilla being lined to the extreme apex with grafts, the skin of the outer flap may be utilized, in redundant fashion, for covering the axillary vessels, for obliterating the subclavian dead space and for elevating the axillary fornix.

REFERENCES.—[1]*N.Y. Med. Jour.* 1912, ii, 949; [2]*Amer. Jour. Med. Sci.* 1913, i, 100; [3]*Jour. Amer. Med. Assoc.* 1914, i, 708; [4]*Lancet*, 1912, ii, 1644; [5]*Jour. Amer. Med. Assoc.* 1913, i, 416.

BRONCHIAL GLANDS, TUBERCULOSIS OF. (*See also* TUBERCULOSIS IN CHILDREN; TUBERCULOSIS, PULMONARY.)

J. J. Perkins, M.B., F.R.C.P.

All are agreed as to the importance of the *early diagnosis* of enlargement of the bronchial glands, because here is the first site of tuberculous invasion in childhood. Though some two dozen signs and symptoms have, according to Zabel[1] been suggested for their detection, conclusions which are generally accepted are far from being attained. The subjective symptoms which are common at the outset of the invasion of these glands, though important as suggestive of the lesion in childhood, are by no means distinctive. Zabel mentions catarrh, pyrexia especially after exercise, asthenia, tachycardia, cough, pain, dysphagia, and dyspnœa in this list. A dry irritative cough due to pressure of the glands is present in 80 per cent of the cases, and precedes any demonstrable swelling. In its character it may recall so strikingly the cough of whooping-cough that it may be impossible to distinguish between the two. Any attempt to swallow with the head thrown back is especially apt to provoke it. Dysphagia was seen by Zabel once only. The pressure of the glandular masses on vessels and bronchi may cause symptoms; but these are rare, partly because the swelling does not usually reach the necessary magnitude, and also because the inferior tracheo-bronchial glands, which are not in a position to exercise pressure, are usually attacked. Enlargement of the superficial veins, difference between the pulses, and laryngeal paralysis from pressure on the recurrent laryngeal nerve occasionally occur, but cannot be expected.

Turning to direct objective symptoms, we are on much surer ground. Radioscopy gives invaluable results; but Zabel warns us that though calcified and caseous glands are easily recognizable, the stage of tuberculous infiltration is not always demonstrable. Moreover these old enlarged glands are not necessarily an evidence of active disease; they are not rarely to be found in healthy individuals, though in childhood their presence is very suspicious and may be taken as an evidence of existing tuberculosis. Percussion of the thoracic wall gives results only in tumours of large size, but percussion over the spinous processes is much more valuable. According to Koranyi, enlarged bronchial glands give diminished resonance over the fifth and sixth thoracic spines, with an increased sense of resistance. In children, dullness is found over the third dorsal vertebra, and positive results are obtained by this means in 40 per cent of the cases.

Auscultation of the voice or whisper over the vertebral spines, the method introduced by D'Espine and referred to in previous issues of the Medical Annual, is, according to Zabel and others, by far the most reliable sign of the presence of enlarged bronchial glands; it is nearly always present, certain in its results, and simple to carry out. In fact, he and many other observers speak of it in the highest terms. The ear or bell of a stethoscope is applied over the vertebral spines from the seventh cervical spine downwards while the child speaks or whispers some word like "thirty-three." The tracheal quality of the voice ceases suddenly at the seventh cervical vertebra in healthy children, but where enlarged glands are present it can be heard below this point for a varying distance—even as far as the fifth dorsal vertebra. The enlarged gland filling up the intervening space between the trachea and the vertebral column acts as a conductor. The presence of the tracheal quality is the point to be observed, and must be distinguished carefully from a mere loud conduction of the ordinary tone. Zabel gives the limits at which the tracheal tone is to be considered pathognomonic in young children at the seventh cervical vertebra; in children of eight years at the first dorsal; of twelve at the second dorsal; and in children of fifteen at the third dorsal vertebra, corresponding to the natural descent with advancing years of the bifurcation of the trachea, in the fork of which the enlarged glands lie. Zabel and many others give D'Espine's sign the first place in the diagnosis of the enlarged bronchial glands of childhood, not even excluding x-rays from this comparison. He has found and proved it positive even when radiography failed.

Reference.—[1] *Munch. med. Woch.* 1912 2064.

BRONCHITIS.

J. J. Perkins, M.B., F.R.C.P.

TREATMENT.—Arneth[1] is a strong advocate of reliance on **Mechanical Measures** in the bronchitis and bronchopneumonia of *early childhood*, as he has found all the drugs in vogue of comparatively little value. He insists strongly upon the advantages of **Change of Position** from side to side, or even upon the face, according to the site of the lesion, unilateral or bilateral, with the view of preventing inaction of the lung and consequent collapse. Packs and tight compresses he views with disfavour, because of the compression they exert on the thoracic wall. Dealing with measures for reducing the temperature he points out that the internal temperature may be very high though the surface is cold, pallid, or cyanosed. He has been compelled to discard the usual procedure of lowering the temperature in such cases by cool baths or applications, on the ground that it does more harm than good, the loss of heat being too much for feeble, devitalized children. He is convinced that the same end can be reached far better by the use of **Hot Baths**, which he recommends most strongly. These equalize the circulation, and by distributing the blood equally over the body have the beneficial effect required with little or no loss of heat, though a slight fall of temperature occurs in most cases, half an hour to an hour afterwards. The internal temperature, however, falls several degrees as a rule. This form of treatment was first advocated among the Japanese, and is a recent introduction to the Western world. In Japan, for example, hot baths (44° C.) have been recommended for the treatment of croupous pneumonia, side by side with the colder applications to which we are accustomed. As regards hot baths in childhood, their use can now be supported by a number of excellent names; Baelz, for example, speaks of their employment in capillary bronchitis as almost specific. The temperature is really hot, 39° or 40° C. to 45° C.; the duration of the bath is five to ten minutes, and the temperature of the water must be kept up during that time. The effect of the bath as seen in well-nourished children is that in two to three minutes the skin reddens; in six to seven minutes the head becomes red and beads of perspiration gather; and after a few more minutes the extremities and whole body become very red. The effect of this hyperæmia is seen in deeper breathing, while expectoration is stimulated and fever lowered. No ill effect on the heart has been noticed by Arneth even in weak infants. To increase the effect on the lung, the hot bath may be followed by cold douching. The child is lifted out of the bath and cold water quickly douched for a few seconds only on the neck and breast; the child gasps, all the auxiliary muscles are called into play, and the effect on the breathing is described as colossal. The child is then dried, clothed in warm things, and put into a hot bed.

In conditions of very high fever the bath is repeated as occasion seems to demand, but of course with great care. The temperature of 40° C., however, is not considered a contraindication. With fever at 40° C. the baths as mentioned are given for five to ten minutes, three-times a day, in the early morning, at midday, and in the evening. The conditions specially calling for this treatment are collapse, cyanosis, and severe dyspnœa; in fact, the worse the peripheral circulation and the weaker the child, the more is the hot bath called for rather than the cold. The children are stated to like these extremely hot baths; their mental condition is improved, they become more lively and sleep well, their appetite is increased, and the diminution in weight and strength so frequently seen in protracted fever is checked, in addition to the beneficial effect on breathing and expectoration mentioned above. During convalescence, Arneth advises the continuance of the hot bath once or twice daily.

Pirie[2] contributes the results of treatment by **Vaccines** in a number of obstinate cases of *chronic bronchitis* and bronchitis with asthma. All were cases of some standing, in which other forms of treatment had been employed with more or less want of success; only those were included in which the results of treatment had been under observation for some time. Autogenous vaccines were administered in all instances, and nothing more remote than the first subcultures of the original organisms were employed. The dosage varied considerably, but the general principle followed was to increase the amount until a dose was arrived at which produced some definite reaction in the shape of general discomfort, slight fever, and not infrequently temporary increase in the amount of the expectoration. Treatment should be pursued on these lines for a considerable time, at least several months. Of 16 cases treated for bronchitis, 7 might be considered as practically cured, in 4 there has been marked improvement, in 4 slight improvement, while 1 was not improved.

A typical case was that of a woman, aged 22, who suffered from chronic bronchial catarrh so severe at times as to amount to actual bronchopneumonia. Treatment was continued for a year, and the report a year later is that there had been complete freedom from bronchial attacks; there were still some moist sounds in the chest, but not enough to cause any serious trouble.

Almost equally good results were obtained in cases of asthma supervening on chronic bronchitis; of 9 cases, 2 could be regarded as practically cured and free from asthma, 5 were considerably improved, 1 slightly improved, and 1 not benefited.

Gillett[3] also insists upon the importance of autogenous vaccines alone being used, and on the importance of avoiding subculturing, which has been said to impair the efficiency of the vaccine. The dose in his practice was pushed until some reaction had been obtained, either general or local, on the ground that a course of small doses where reactions have not occurred may be ineffective in producing immunity.

An excellent example of the success obtained is seen in the case of a woman, aged 65, who had a bad attack of influenza seventeen years before. Ever since that attack she suffered from a chronic cough, bringing up about 2 oz. of phlegm daily. At the time of the commencement of treatment she was unable to lie flat at night, and after four injections was able to do so. The cough and sputum had ceased at the end of five weeks, and though later on she began again to bring up a little sputum, the cough and expectoration completely disappeared after three further injections. In another case, a woman, aged 55, had suffered from bronchial asthma for fifteen months. Though able to get about, she was very short of breath, and frequently had attacks of dyspnœa at night. Treatment by vaccines was continued for four months with complete success; the patient was soon able to lie down at night, and sleep through to the morning; the amount of sputum was reduced from 1 oz. daily to ½ dr.; the asthma completely disappeared, and the patient could even go upstairs without shortness of breath.

Campbell[4] insists that the liability of *stout people* to bronchitis is largely due to the endogenous formation of poisons which produce inflammation of the respiratory passages, and to the sluggishness of the blood-flow through the bronchial mucous membrane. The chief factor in treatment of a stout bronchitic, therefore, is the **Reduction of Weight.** He does not take exercise because he gets out of breath so easily, and the lack of exercise makes him stouter still. In the acute attack, Campbell's first step is to get the patient plenty of cool, fresh air to breathe, by wheeling his bed or his chair to the open window. He allows **Oxygen** also, applies **Leeches** over the liver, gives **Calomel** gr. 5, and **Carbonate of Ammonia.** As regards **Food,** he would in all cases of this kind withhold it altogether for a few days at least. In his own words: "In all cases of acute dyspnœa, starve the patient," and in this there need be no fear of any ill results. Every particle of food, he says, which is absorbed into the blood and not laid down as tissue or got rid of as albumin or sugar, causes an immediate increase in the production of carbonic acid, the excess of which in the blood is the essential cause of the dyspnœa. To satisfy the patient, a little beef-tea, or a small portion of minced underdone lean meat, may be given; as regards drink, as much water as the patient likes, or weak China tea, but little or no alcohol. He finds the same factors at the root of the chronic bronchitis of the obese. Pure, dry, and if possible warm air is the first essential. For the second object, the reduction of weight, he has recourse to diabetic diet, i.e., the elimination of starch and sugar, and prescribes a good amount of **Exercise.** A regular aperient is given every night (**Paraffin,** or **Hyd. c. Creta,** 1 gr., with **Ol. Ricini** 1 dr.) and the ordinary **Alkaline Expectorants,** though the latter play but a secondary part. The concluding words of the writer are excellent: "There is a danger that, as we become more scientific, we may neglect the more prosaic dictates of common sense and neglect the obvious; more can be done for the obese bronchitic by reducing his weight, tending his digestion, and regulating his exercise, than by any other measures, scientific or otherwise."

REFERENCES.—[1]*Deut. med. Woch.* 1913, 1582; [2]*Brit. Med. Jour.* 1913, i, 1260; [3]*Ibid.* 1261; [4]*Clin. Jour.* 1912, Oct. 23.

BRONCHOSCOPY. (*See also* ŒSOPHAGUS.)

W. G. Porter, M.B., F.R.C.S.

Chevalier Jackson, in his report to the International Medical Congress, said he had addressed enquiries to 350 laryngologists in America, of whom only 70 had attempted *bronchoscopic* or *œsophagoscopic* foreign-body work, and only 35 cared to do it. As regards mortality, in 171 cases of foreign body in trachea and bronchi bronchoscoped during the last two years by various operators, there were 9 deaths (5·3 per cent), and in 156 the body was removed. The author's own statistics, which are not included above, are as follows: in the last 182 consecutive cases of bronchoscopy for foreign body, there were 3 deaths (1·7 per cent) from any cause whatever within one month. The foreign body was removed in 177 cases.

Of 193 cases of œsophagoscopy for foreign body by various operators, the foreign body was removed in 155; of the 38 not removed, 26 went down. There were 12 deaths (7·8 per cent). In 7 of the deaths the œsophagoscopy was done by operators whose total number of cases was less than 3. In the large clinics the mortality was 3 per cent. Of 206 cases of the author's the foreign body was removed in 198 and escaped downwards in 8. There were 4 deaths, 3 in patients admitted with severe lacerations from previous attempts at œsophagoscopy.

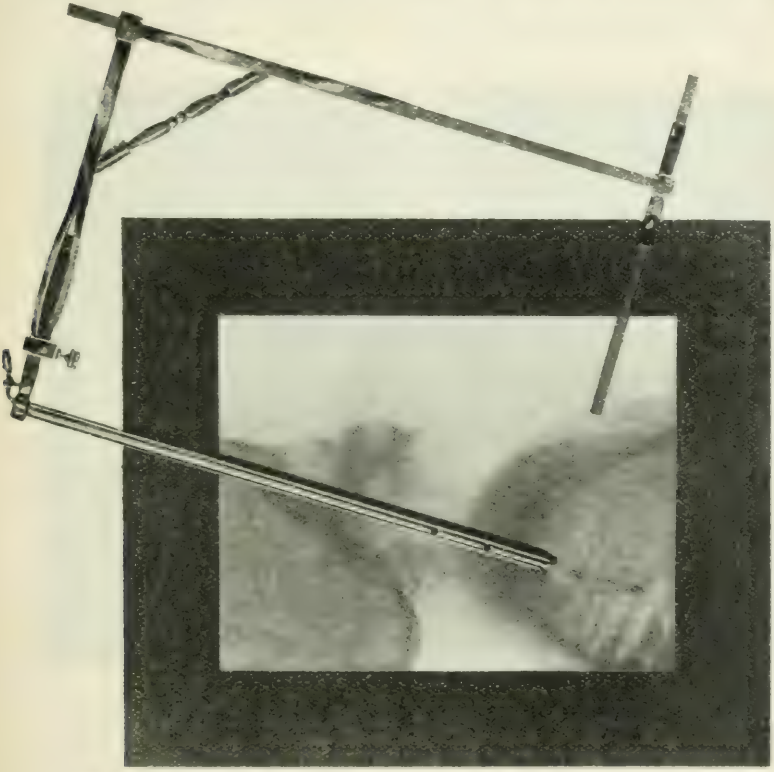


Fig. 12.—Illustrating the position of the caliper-guide in getting the adjustments by which the point of the bronchoscope can be brought at operation in close proximity to a foreign body. For use in case of small foreign bodies in minute bronchi. *Suggested by Dr. John W. Boyce.*

Excellent progress has been made in the *radiographic* localization of foreign bodies, especially now that practically instantaneous radiographs can be taken. The improvement in lateral radiography of the thorax has been of great aid in the localization of foreign bodies in conjunction with the caliper guide suggested by Dr. Boyce (*Fig.* 12) and developed by the author. This will bring the point of the bronchoscope in close relation with the foreign body. It is used only in the case of small foreign bodies which have fallen into a very small bronchus far down or far out near the periphery of the lungs. Another aid in this class of difficult case has been used by the author. A positive transparent film of the tracheo-bronchial tree (*Figs.* 13, 14) is laid over the negative of the patient, showing the foreign body, when the latter will show through the transparent tracheo-bronchial tree of the overlying positive film. There are twelve sizes of film positives, from which one to correspond to the size of the patient's negative is selected.

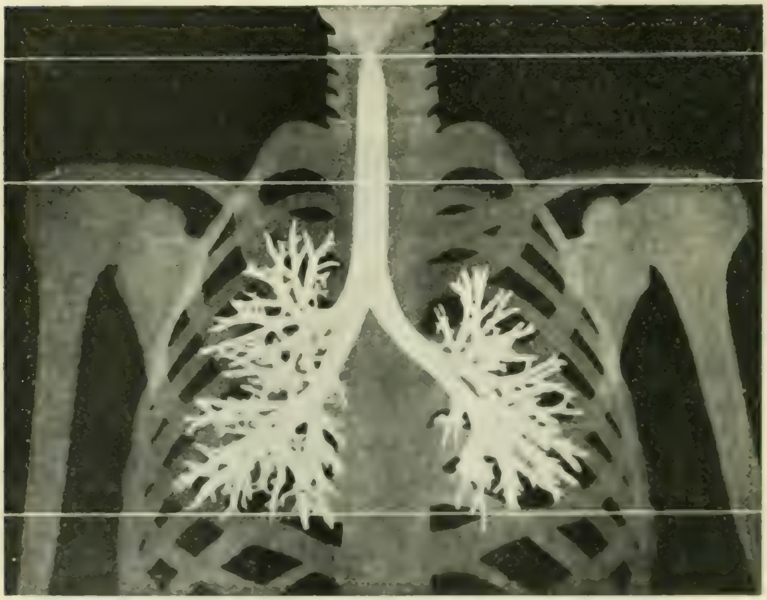


FIG. 13.—Illustration of a positive film used for overlaying [illegible] localization of foreign bodies or lesions in the [illegible]. The lower white line [illegible] corresponds to the diaphragm, the middle line [illegible] to the dome of the pleura. [illegible] [illegible] [illegible]. The upper line [illegible] corresponding to [illegible]. [illegible] positives [illegible] are on hand, so that a tree of [illegible] [illegible] pattern.

In the statistics which the author gathered, there was practically no difference in the mortality or the percentage of successful removals of foreign bodies between the different kinds of *instruments*; far more depends on the individual skill of the operator, and doubtless the best instrument for each man is the one with which he has practised most.

The author insists that the *preparation of the patient* should be the same as for any operative procedure, by a cathartic, rest in bed, with cleansing of the mouth by numerous brushings of the teeth and rinsings with 30 per cent alcohol. For adults the sitting *position* is very satisfactory for diagnosis. For infants and children the dorsal position is better because of better control of the patient. In foreign body cases, whether adults or children, the patient should always be recumbent. This is especially true of foreign bodies in the larynx and pharynx, which should never be touched unless the patient is in the Trendelenberg position.

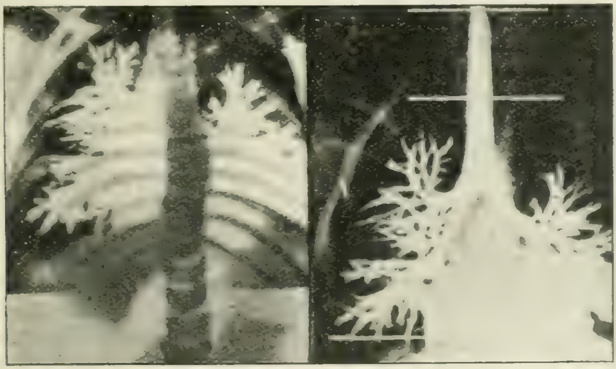
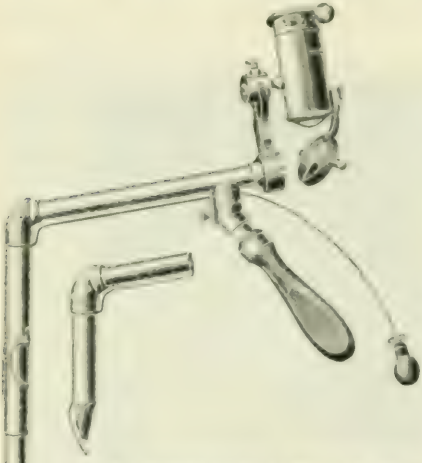


Fig. 14.—Illustrating a positive radiograph of the tracheo-bronchial tree used as a film for overlaying to assist in localization of a foreign body. The left-hand illustration shows the film laid over a negative of a patient in whose left main bronchus was a pin. Localization verified by bronchoscopy. The shadow of the pin is strengthened with ink.

The author's remarks on *anæsthesia* are of especial interest and importance, and are contrary to what has been the custom in this country. He states that recent progress in anæsthesia is towards the use of no anæsthetic at all. After a short period of tubal contact in bronchoscopy, coughing lessens and often practically ceases, especially in infants, without any anæsthetic having been used. The author's views are as follows: (1) In children under six, no anæsthetic, general or local, should be used for direct laryngoscopy, per-oral bronchoscopy, or œsophagoscopy, except that general anæsthesia may be advisable in the case of very sharp foreign bodies. (2) In adults, no anæsthesia, general or local, is necessary for œsophagoscopy, for diagnosis or for foreign bodies, save in the case of very sharp or large ones. Local anæsthesia of the œsophagus is unnecessary. For bronchoscopy for diagnosis, anæsthesia of the larynx, including the epiglottis, is needed. In the last 107 bronchoscopies and œsophagoscopies for foreign bodies in children under six years of age done in the author's clinic, no anæsthetic, general or local, has been used.

Indications for Bronchoscopy.—The author enumerates the following: (1) The appearance in the radiograph of a foreign body or any suspicious shadow; (2) A clear history of the patient having choked on a foreign body, which has not been afterwards found; (3) Signs of stenosis of the trachea or a bronchus; (4) Signs of pulmonary tuberculosis in which the bacilli cannot be found in the sputum, and especially if the physical signs are at the base, particularly the right base; and above all if there are physical signs of pleural effusion, even if there be no history of a foreign body; (5) All cases of bronchiectasis should be bronchoscoped for foreign bodies and also for local treatment; (6) Dyspnœa, except of course in pneumonia and similar well-understood conditions; (7) Dyspnœa which tracheotomy has failed to relieve; (8) All cases of hæmoptysis not definitely proved to be tuberculous; (9) Paralysis of the recurrent nerve, the cause of which is not positively known; (10) Thoracic disease in which any element of doubt exists. In case of doubt as to whether bronchoscopy should be done or not, it should always be done.



[illegible]

As regards post-bronchoscopic *subglottic œdema*, the author believes this is due in many cases to rough manipulation and to the introduction of tubes which are too large for the infant larynx; in other cases the supposed subglottic œdema is really due to the accumulation of secretions, and can be relieved by the passage of the tube; and he especially urges that all cases of post-bronchoscopic œdema require the passage of the bronchoscope before resorting to tracheotomy. The author uses tubes of 4 mm. and 5 mm. internal diameter for children under six. He is a strong supporter of per-oral as against tracheotomic bronchoscopy. In the palliative treatment of inoperable œsophageal cancerous stenosis he has found œsophageal intubation very satisfactory, and by this means gastrostomy may be postponed; intubation tubes have been worn for quite a number of months without exciting ulceration. They were, of course, removed at frequent intervals for cleaning, and were replaced. Jackson concludes his paper with the statement that all future progress will depend on those who have the time and the opportunity to develop an organization with assistants and nurses well trained, and to develop by continual practice the skill such as the musician must have with his instrument.

Sir St. Clair Thomson[1] records a case in which a toothplate, which had been impacted in the œsophagus for two and a half years, was removed through the mouth. The interest lies in the fact that the patient had been examined several times by x-rays and by œsophagoscopy, and bougies were also passed with negative result, so that hysteria was diagnosed. The plate was finally detected by Dr. Moore by the direct method, and removed by the author.

Lewisohn[2] has constructed an *œsophagoscope* on a new principle, which permits of the introduction of the instrument in the normal position of the head. It passes in the longitudinal axis of the œsophagus, and not at an angle to it, and is passed under guidance of the eye. It consists of two portions, which are jointed at almost a right angle: a horizontal portion which lies in the mouth of the patient during an examination, and a vertical portion consisting of a telescope of six separate tubes which may be pushed down into the œsophagus as far as necessary (*Fig.* 15). The lamp and condenser lie outside the mouth at the proximal end of the horizontal tube. The total length from the teeth to the end of the instrument is 45 cm. In examinations, the pharynx is cocainized, and the patient sits on a chair, the head being supported by an assistant. The first stage, or the "anchoring" of the instrument in the œsophagus, is performed blindly. It is pushed in the middle line to the posterior wall of the pharynx. The handle is then raised until the ocular becomes horizontal, and in this way the instrument glides automatically over the epiglottis and arytenoids. The second stage is done under the guidance of the eye, the telescope being opened by pushing down a spring. When the examination is finished, the spring is gently pulled until the telescope is again closed.

REFERENCES.—[1]*Lancet*, 1913, i, 16; [2]*Ann. Surg.* 1913, i, 28.

BUBO, CLIMATIC.

Leonard Rogers, M.D., F.R.C.P.

A. J. J. Triado[1] reports on fifty cases of this disease seen by him in Western Australia. All occurred in white men who had had sexual intercourse with aboriginal women. The buboes are very chronic and continue for months. If simply incised, the discharge continues without any sign of healing. The only efficient treatment is complete **Excision**, when the glands will be found to be separate and to show a little softening in their centres. The diagnosis from syphilitic and gonorrhœal buboes is quite easy.

REFERENCE.—[1]*Austral. Med. Gaz.* 1913, 442.

BURSITIS, SUBDELTOID.

Priestley Leech, M.D., F.R.C.S.

Flint[1] recommends **Aspiration** of the subdeltoid bursa in acute traumatic bursitis. He reports two cases where aspiration of 4 c.c. of a clear fluid permanently relieved the condition. The symptoms were: a painful point in front of and below the tip of the acromion process, palpation of the head of the humerus in the axilla is painless; adduction and also complete internal and external rotation with hand and arm at the side are possible; abduction is limited to 15° or 20°, and there is inability to put the arm behind the back. The effect of the aspiration was instantaneous.

H. Flint thinks the chief factor carrying the condition on to chronicity, with marked thickening of the wall of the bursa, is not so much the severity of the primary injury, as the repeated traumatisms caused by movements of the shoulder joint which cause the already distended bursa to strike against the coraco-acromial ligament.

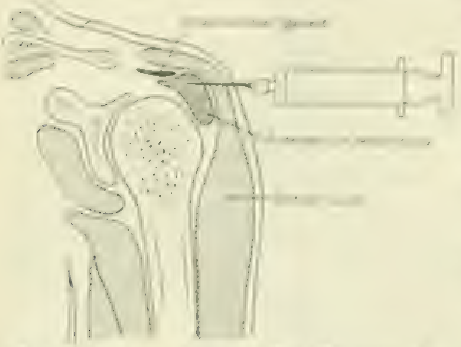


Fig. 19.—Diagram showing method of injection in subdeltoid bursitis.

The method is as follows: A Luer syringe is partly filled with about 1 c.c. of sterile cocaine or novocain solution; the solution is injected into the skin, and ahead of the needle as it passes through the deltoid. The needle is pointed roughly parallel to the clavicle and directed towards the bursa lying just over the bicipital groove. The point of entrance is about 2 cm. below the level of the acromion process. As the point of maximum tenderness lies directly over the bursa, this will perhaps prove the best guide for the needle, for it was at this point that fluid was obtained in Flint's cases (*Fig.* 19).

Reference.—*Jour. Amer. Med. Assoc.* 1913, i, 1224.

CAISSON DISEASE.

Purves Stewart, M.D., F.R.C.P.

Modern engineering often necessitates the use of caissons of compressed air, within which the men have to work for periods usually of three to four hours at a stretch. When entering the caisson the worker has little or no discomfort, and is in no danger. It is during and after the period of decompression, when returning from the compressed air chamber to the ordinary atmospheric pressure at the surface of the ground, that symptoms are liable to occur.

Etiology.—Erdman was for two and a half years a member of the medical staff of the huge East River Tunnel between New York and Long Island, in which over 10,000 men were employed, and where between three and four thousand cases of illness of minor and major severity were reported. In a valuable paper[1] he records his experience of the acute symptoms of caisson disease. The causation of the symptoms is now universally admitted to be the occurrence of air-emboli in the blood and tissues. During the period of work in compressed air, the fluid and tissues become saturated with an excessive amount of atmospheric air. Whilst the man remains in the compressed air, no pathological symptoms develop; but during the period of decompression, if this be carried out too rapidly, the air diffuses out of the capillaries, and is set free as bubbles in the body-tissues and fluids, forming air-emboli, air thrombi, or even larger collections of air in various parts of the body.

During *compression* certain interesting phenomena occur which are mechanical in origin and may be regarded as physiological. The rise of atmospheric pressure pushes the tympanic membrane inwards, and unless the pressure in the middle-ear be equalized by admitting air through the Eustachian tube by Valsalva's or some equivalent method, acute pain may result, and even rupture of the membrane. The body temperature rises slightly and sweating occurs. The denser air offers increased resistance to expiration and to phonation. Whispering becomes impossible, and whistling difficult or impossible. The voice loses its natural quality and becomes intensely nasal. A sense of exhilaration develops, with unusual ease of movement. The pulse, blood-pressure, and respiration do not change, nor does the composition of the urine or sweat become altered. Hearing is not affected. During *decompression* the body becomes chilled, owing to the falling temperature in the air-lock. A crackling noise is often heard in the ears as the air escapes through the Eustachian tubes.

PATHOLOGICAL SYMPTOMS.—These occur after decompression is complete. Out of 3,692 cases among the East River Tunnel workmen, 50 per cent occurred within thirty minutes and 95 per cent within three hours. Only 1 per cent were delayed over six hours.

Pain is by far the commonest symptom, developing in 88 per cent of the cases. It may occur alone or with other phenomena. The most frequent site is in the knees, forcing the patient into an attitude which is popularly known as the "bends." Pains in the elbows and shoulders are less common. It is probably due to an effusion of air in the neighbourhood of the affected joints, either in the fascial planes under the periosteum or, as Hill suggests, in the yellow bone-marrow.

Vertigo occurred in 5 per cent of cases, and is explainable by the formation of bubbles in the labyrinth of the inner ear; or, when accompanied by nausea and vomiting, it may be due to air embolism of the cerebellum. Cerebrospinal symptoms, paraplegia or hemiplegia, transient or permanent, occurred in a little over 2 per cent. Dyspnœa of an asthmatic type occurred in 1·5 per cent, possibly due to multiple air-emboli in the pulmonary vessels. Prostration of moderate degree accompanied the pain in 1·25 per cent, whilst collapse with partial or complete unconsciousness happened in 0·5 per cent. Fatal cases were twenty in number, or 0·54 per cent, occurring either with symptoms of unconsciousness and collapse, or with pain, prostration, nausea, and vomiting, or from paralysis either immediately or with subsequent complications.

The *late manifestations* of caisson disease, i.e., the ailments met with in compressed-air workers, years after the exposure and the acute manifestations, have been studied by Bassoe[2] of Chicago. He examined 161 such men, and groups them into three classes—caisson myelitis, arthritis, and aural disease. Some men presented symptoms belonging to two or all three of these classes; but usually one set of symptoms predominated. Out of 161 men, 87 had various affections of the ears, causing permanent impairment of hearing in 65 cases; 131 gave a history of "bends," i.e. severe muscular and articular pains; 34 had paralysis, generally transient and affecting the legs, although 3 men had permanent paresis of one and 3 of both legs; 12 had signs of disease affecting the spinal cord; 11 had incontinence or retention of urine; 11 had chronic joint-pains and stiffness; 35 complained of vertigo, of whom 6 had nystagmus superadded, probably labyrinthine in origin. Cases with permanent joint affections showed the clinical and x-ray phenomena of arthritis deformans. Some of them are probably due to localized liberation of air in the neighbourhood of the articular surface; others are of neuropathic origin, secondary to spinal-cord lesions. In every case where permanent deafness was present, this was found to be of labyrinthine origin. Rupture of the membrana tympani was rare, and in no case caused permanent deafness.

TREATMENT.—Caisson disease can usually be prevented by taking care that the worker is not decompressed too rapidly, and that he passes through an air-lock in which the atmospheric pressure is gradually reduced to normal, allowing about twenty minutes for each atmosphere of pressure. This affords time for the air in the blood to diffuse slowly into the lungs, instead of effervescing into the tissues.

For the actual treatment of caisson disease, the most beneficial method is to place the man back in the air-lock without delay, and there to re-compress the atmosphere to the original pressure at which he had been working. In this way the effervesced air may be re-absorbed into the blood. He is then slowly decompressed again. In cases where re-compression has not been carried out sufficiently early, i.e., within an hour or so of the symptoms, we must be content with analgesic drugs, massage, etc., and with the usual remedies for chronic spinal cord affections.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1912, i. 316; ²*Ibid.* 326.

CALCINOSIS, MULTIPLE SUBCUTANEOUS.

E. Graham Little, M.D., F.R.C.P.

This seems to be a sufficiently definite disease, though extremely rare, to merit separation and naming; and Parkes Weber¹ under the above title describes a case occurring in a German girl aged 7 years, showing a number of hard nodules in the subcutaneous tissue of the extremities and trunk. The nodules were mostly smaller than a pea, but some were much larger. They could be seen in skiagrams, being especially numerous about the knee and hip; they consisted largely of calcareous material (calcium carbonate and phosphate) embedded in a spongy network of connective tissue. Occasionally the nodules became inflamed, and discharged thin purulent matter mixed with calcareous débris.

No cause could be ascertained, and there was no sclerodermia such as has been associated with this condition in other cases; such as that reported by Hunter,[2] in which calcareous deposits were found in association with both sclerodermia and Raynaud's disease. The nodules had been present for about eighteen years when the sclerodermia had also shown itself; the latter condition had invaded the whole of the face, neck, buttocks, hands, arms, and knees. There was marked sclerodactyly. The bones of the fingers were unaltered. There was an increase of pigment in the skin all over the body.

The treatment consisted in inunction with **Oil** and subcutaneous injection of **Fibrolysin**, continued for two months, and was productive of marked benefit.

REFERENCES.—[1]*Brit. Jour. Child. Dis.* 1913, 97; [2]*Glasg. Med. Jour.* 1913, i, 241.

CANCER. (*See also* ARSENICAL CANCER, BREAST LIPS, ŒSOPHAGUS, PANCREAS, PROSTATE, RECTUM, SKIN, STOMACH, TONGUE, UTERUS.)

K. W. Monsarrat, F.R.C.S.

DIAGNOSIS.—Certain methods for the diagnosis of cancer have been published of late, of which the three following may be noted.

(*a*). The *carcinoma skin reaction.*—In 1910 Elsberg, Neuhof, and Geist proposed a method of diagnosis by skin reaction, the technique being the subcutaneous injection into the forearm of 5 min. of a 20 per cent suspension in salt solution of washed human red corpuscles obtained from a healthy individual. Their results showed a characteristic reaction in 89·0 per cent of cancer cases, and no reaction in 94·3 per cent of non-malignant cases. Lisser and Bloomfield[1] have done further work on this reaction, in particular with a view of avoiding the possibility of error from the presence of normal isohæmolysins. They state that the reliability of the blood of the individual used must be tested, the type which is reliable being that whose corpuscles are neither agglutinated nor hæmolysed by any sera in vitro. About 15 c.c. were withdrawn from this healthy source, and a 20 per cent suspension injected subcutaneously. A positive reaction begins to appear three to five hours after injection, and when developed presents as a somewhat irregularly oval area raised from the surroundings, slightly boggy on palpation, and often tender, varying in colour from a brownish-red to a maroon. In 62 cases of verified malignant disease, two-thirds gave a positive reaction and one-third were negative. In 94 control cases, 91·6 per cent were negative and 8·4 per cent positive. A positive reaction is therefore strong presumptive evidence of cancer.

(*b*). Ransohoff[2] published a report two years ago showing that there is a decided difference in the *anaphylactic reaction* when guinea-pigs sensitized with blood-serum from a normal individual, and other guinea-pigs sensitized with blood serum from a cancer-bearing individual, are both given a final dose of blood serum from a cancer patient. From these experiments he inferred that there is some specific substance in the blood-serum of cancer patients, probably absorbed from the tumour itself. He has applied this method of showing the difference in the anaphylactic reaction of normal and cancerous blood-serum to the diagnosis of cancer. He reports his results in 50 cases, 30 cancer cases and 20 controls. In all the cases together the margin of error was 8 per cent.; the correct diagnosis was made in 92 per cent.; in the cancer cases alone a correct diagnosis was made in 86·7 per cent. The tests were never positive in non-malignant cases. This work goes to show that the anaphylactic test may prove of use in the diagnosis of early cancer; there were five early cases which gave positive results. The uniformity of negative tests in non-malignant cases is a point of value, and a positive result appeared to be reliable evidence of the presence of cancer.

G. Sturrock[2] has carried out further work on the estimation of the *alkalinity of the blood-serum* of cancer patients. He used and somewhat modified the "dimethyl" method employed by Moore and Wilson. His results showed that the average alkalinity in cancer cases was appreciably higher than in the non-malignant. They enable him to state that a high alkalinity affords some presumption of the presence of cancer—sufficient, he considers, to justify an exploratory operation in doubtful cases. Low figures are not, however, any guarantee of the absence of cancer. The method does not appear, therefore, to be of much assistance in diagnosis.

PATHOLOGY.—W. J. Mayo[3] has drawn attention to the importance of recognizing that carcinoma may be disseminated by grafting in the course of operations. Spontaneous autogenous grafting is a recognized method of extension of the disease. Examples are found in the grafting of cancer from lip to lip and from one part of the alimentary canal to another. He gives some interesting illustrations. In one case the disease attacked the needle punctures made in closing the abdominal incision after a resection of carcinoma of the stomach. In another, a case of cancer of the rectum, the disease was engrafted on the granulating surface of a colostomy wound. During operative manipulations, pieces of the carcinoma must have been loosened and left in the sigmoidal pouch, and the granulating surface thus infected. He also remarks that several cases of cancer of the breast had come under observation which had been squeezed and manipulated by ignorant persons until a comparatively curable case had been rendered hopeless because of acute involvement of the skin and fascia. In amputation of carcinoma of the cervix uteri, he considers that the cautery is preferable to the knife, owing to the opportunity furnished by the latter for carcinomatous infection of the wound, and traumatic dissemination through the lymphatic and vascular systems. On this evidence, it is necessary to use technique which will exclude the possibility of operative dissemination, and carcinoma should be treated as though it were a focus of virulent infection.

F. T. Paul[4] shows that the histological features presented by squamous-celled cancer give data for prognosis in given cases. Warty growths are more favourable than ulcerating ones; the more malignant a growth is, the earlier it breaks down and ulcerates. Cancer that originates in scars, embryonic rests, and sebaceous cysts is usually under the average in malignancy. On the other hand, when commencing as the result of chronic irritation, it is usually very malignant. With regard to early growths, the chronic warty tumour (*Plate VIII, Fig. A*) is of good prognosis; a widespread down-growth of fine trabeculæ of epithelium over an ill-defined area is the worst type (*Fig. B*), and is characteristically seen in cancer of the tongue supervening on syphilis. The cell type is important. One of the most favourable is that in which there are large processes of small uniform cells, with slight tendency to cell-nest formation (*Plate IX, Fig. C*). Such growths afford good prospect of cure by operation. When the epithelial processes consist of cells with clear cell-bodies and small nuclei (*Fig. D*), and the intervening connective tissue is small in amount and shows little or no leucocytosis, the prognosis is also good. On the other hand, when the cell groups are irregular, the nuclei and the cell bodies variable in size, and nest-cells common, the prospect is bad. Marked round-cell infiltration is also a bad sign (*Plate X, Fig. E*), as is indifferent limitation. When cancer cells are present in lymphatic vessels and spaces outside the area of the growth proper, the case belongs to the worst type (*Plate X, Fig. F.*). There is then little chance of permanent cure. A comparison of the naked-eye and histological characters of growths is not only of assistance in prognosis, but enables the surgeon to plan an adequate attack on the disease.

Howard W. Nowell[6] reports the results of experiments with a crystalline substance extracted from fresh cancer material. Its chemical composition has not yet been determined; it was obtained by an elaborate method of digestion, precipitation of soluble proteins, extraction with alcohol and ether, and evaporation of a final aqueous solution. The product thus obtained proved highly toxic to rabbits and guinea-pigs. In addition to this general toxic effect, injection in sublethal doses into rabbits produced "well-defined, well-characterized carcinomata," the site of the primary lesion being different from, and independent of, that of the injection. In an initial series of experiments, three rabbits developed the clinical picture of malignant disease, the degree of the development of the specific manifestation varying with the site of the inoculation. The post-mortem examination showed extensive and characteristic glandular involvement. In another series, five rabbits received intra-abdominal injections. Although the abdomen was the site of all injections, the primary lesions developed severally as follows: one in the thyroid; one on the right cheek involving the nose and orbit; one on the left foot; the remaining two on the head. All showed the characteristic progress of a general cachexia. The necropsies demonstrated the presence of "numerous metastatic growths; the histological examination leaves no doubt as to the malignant character of both primary and secondary lesions." In another series an extract was prepared in a similar way from benign tumours; but neither local nor general signs of toxic action were produced. Nowell publishes no illustrations with his article. In view of the importance of the claims made for this research, there is a regrettable want of precision in the report on the main contention, the production of actual carcinomata by experimental injection.

There was an interesting discussion on the pathology of cancer at the International Congress of Medicine. Bashford spoke on the subject from the point of view of its experimental study. Generally he looked upon cancer as an indirect result of chronic irritation, but no pronouncement could be made as to the direct or actual cause. He did not incline to the view that any "cancer parasite" was responsible, as in addition to the fact that the disease differed in many respects from the known infective diseases, it was difficult to conceive of a parasite capable of determining at one time cancerous proliferation in epithelial and gland cells, and at another in connective tissues. The only common property of malignant tumours was the cell itself, and he was inclined to believe that the cause which led to the proliferation and unbounded growth was some subtle chemical or biological agent. He demonstrated the results of experiments in the production of immunity to tumour-grafting in mice and rats. He showed that a grafted tumour which failed to grow progressively conferred more or less complete immunity to implantation; a still more complete resistance was conferred by embryonic skin, blood, and other tissues from the same species. He, however, warned his audience that results obtained from immunizing experiments were not to be regarded as indications of cures or even protective measures to be applied to human beings.

At the same discussion, Freund stated that the normal blood contained a substance which was able to destroy cancer cells. This substance he had isolated, and demonstrated that it was a fatty acid. It was not present in the blood in carcinoma, but in its place a substance had been isolated which possessed the power of destroying the fatty acid normally present. He considered that the destructive bodies were present in the blood of every cancer case, and also in the organs. He was of opinion that chronic physical or toxic irritation produced a predisposition to cancer by destroying the normal fatty acids.

Lazarus-Barlow held that the etiology of cancer was inseparably associated with the radio-active content of the tissues. Radio-active material was present in larger quantities in cancerous tumours than in normal cells. He showed tables demonstrating that normal tissue contained a quantity of radio-active matter represented by 1; non-cancerous tissues from individuals suffering from cancer contained 25, the primary tumour 51, and the metastases 55.

TREATMENT.—Zeller publishes results obtained by the treatment of cancer, mostly superficial, with **Silicic Acid** and a **Mercury-Arsenic Paste.** These methods are not new, and while they have their disadvantages (the paste causes much pain), they may be of service under the conditions in which Zeller employed them. He gives details of 57 cases, 43 of whom were apparently cured with healthy-looking scars. In the greater number the disease was on the surface, but some examples affecting the upper jaw, lips, mucosa, and vagina were of the type of deeply infiltrating cancers, and healed after great destruction of tissue. In 20 of the cases the diagnosis was verified microscopically, in the remainder it was clinical only. The paste used was the old cinnabar-arsenic paste of Astley Cooper. It was applied thickly over the ulcers, and repeated in eight to fourteen days according to the activity of the reaction. The silicic acid was given in the form of a powder, composed of equal parts of potassium and sodium silicate, ½ gram three times daily. In a prefatory note to Zeller's article, Czerny credits the paste for the most part with the results achieved, and commends its use in superficial inoperable cancers.

Abbe[3] gives an interesting summary of the present position of **Radium** treatment, and also his own experience. The latter extends to 750 cases, including 250 epitheliomata of all parts; 180 carcinomata of the tongue, throat, œsophagus, rectum, uterus, breast, etc; 50 sarcomata of the skin, parotid, bones, etc.; besides goitres, tumours of the liver and mediastinum, and a variety of nævi, moles, papillomata, etc. Of the "numerous failures," he considered most were due to inadequate amount or insufficient time of application, or error in using the proper rays. The gamma rays are alone to be employed. He endorses the opinion of Wickham, that malignant tumours must first be excised as thoroughly as possible, and radium then used upon the bed of the disease. The paper contains many valuable clinical illustrations. The writer's conclusions are: (1) An undoubted retrograde degeneration of malignant cells occurs under correct dosage of gamma radiation; (2) Effective use of radium lies in the application of a large enough quantity to avoid the stimulating action of little doses at short range; (3) The utilization of gamma radiation with its deep penetration can be made by the removal of alpha and short beta rays by filtration through lead; (4) Such filtration requires many times as long for a sufficient amount of gamma rays to act, as when other rays are eliminated by what may be called "distance filtration." One and a half inches, or 4 cm., seems in practice to exclude most of these, and gives free and instant play of the entire gamma range without delay of passage through lead; (5) Cross-firing of several specimens simultaneously, or of one large specimen moved successively to several neighbouring places, is necessary for the best work; (6) Normal tissue resists many times as large doses of gamma rays as are required to check and dissipate morbid growths.

Knox[4] points out that while the action of radium cannot properly be called selective, it acts on cells according to their resistance, and young, actively growing cells are more readily influenced than mature cells. The cells of a new growth belong to this type. According to this writer, in every early case of malignant disease, operative measures should come first, but there are conditions under which radium should be the second choice. The patient may refuse operation, and thorough treatment by radium in early cases may lead to a disappearance of the growth. The risk of operation may be too great. Inoperable cases are many of them hopeless from the curative point of view, but radium will relieve pain, diminish discharges, check hæmorrhages, and frequently heal up ulcers of considerable size. (*See also* RADIUM AND THORIUM.)

Colloidal Copper has been credited with an influence on the growth of cancer. Gelarie[10] records some results of experiments in which he injected cuprammonium sulphate and colloidal copper into mice suffering from inoculated cancer. The results were rather indefinite; they showed that by means of these injections a certain proportion of implanted tumours are changed into a stationary condition or undergo retrogression. Complete disappearance, however, occurred in only 25 per cent of the mice treated with cuprammonium sulphate, and only 6·3 per cent of those treated with colloidal copper. Weil[11] gives the results obtained in Cornell Medical College from a study of the effect of colloidal copper on malignant disease in human beings. Twelve cases were submitted to intravenous injection: four received a thorough and prolonged course of treatment; four received between fifteen and twenty injections; in the remaining four the injections were discontinued in consequence of undesirable effects. Weil considers that a demonstrable reduction in size of a tumour is the only really reliable clinical guide to the effect of treatment. In many cases certain improvement was witnessed as regards appetite, spirits, function, and also in the character of the discharge. The treatment resulted in most of the cases in the production of mild constitutional effects, such as chills, nausea, some loss of weight, slight reduction of hæmoglobin, and occasional albuminuria or hæmoglobinuria. Chemical analysis of two tumours from patients treated failed to reveal the presence of copper, while in a liver obtained at necropsy it was present in appreciable quantity. Judged by the standard of growth retrogression, the treatment did not appear to exert a destructive action on the tumour tissue in any of the cases. This careful report, though negative, is of value in view of the claims put forward for this method of treatment.

REFERENCES.—[1] *Johns Hop. Hosp. Bull.* 1912, 356; [2] *Jour. Amer. Med. Assoc.* 1913, ii, 8; [3] *Brit. Med. Jour.* 1913, ii, 780; [4] *Jour. Amer. Med. Assoc.* 1913, 512; [5] *Liverp. Med.-Chir. Jour.* 1913, i, 225; [6] *Bost. Med. and Surg. Jour.* 1913, ii, 137; [7] *Münch. med. Woch.* 1912, 1841; [8] *Lancet* 1913, ii, 554; [9] *Brit. Med. Jour.* 1913, i, 1100; [10] *Ibid.* 1913, ii, 102; [11] *Jour. Amer. Med. Assoc.* 1913, ii, 1034.

CANCER, LABORATORY DIAGNOSIS OF. (*See also* BLOOD, EXAMINATION OF.)

Oskar C. Gruner, M.D.

The three sources of material for investigating the presence or not of cancer in a person are: (1) *The gastric contents*; (2) *The urine*; and (3) *The blood*. Much work has been done on these secretions during the year.

GASTRIC JUICE.—The *glycyl-tryptophan* test is discussed by A. Graham Dixon[1] and Friedmann.[2] The latter points out its fallacies: (1) Occult blood gives a positive reaction, and fibrin occasionally does the same. (2) Bile and pancreatic juice that have entered the stomach will give the reaction, and it is necessary to make a preliminary test [illegible] water is added to the filtered gastric contents) before adding the reagent. (3) If the acidity is more than 0·30 per cent hydrochloric acid, the ferment responsible for the test in question would be destroyed. (It is, however, extremely rare to have acidity at all in gastric cancer.) (4) Strong tea would disturb the reaction. The facts appear to be that in a number of cases, the test comes out positive in gastric cancers, but it is not invariable to find a negative result in cancer cases. The work of Bryce shows that while the reaction is never obtained in healthy persons, or in chronic ulcers of the stomach and general diseases, it is variable, not only in cancer of the stomach, but also in anacid and subacid conditions, in hyperacidity, hypersecretion, and other diseases of the digestive tract and its associated organs.

Schryver and Singer[3] give a new method of examining the gastric juice for cancer. They estimate the nitrogen in the gastric contents in terms of the number of c.c. of decinormal soda solution required to neutralize the ammonia produced by Kjeldahlizing 10 c.c. of juice, and they make a dimethyl and phenolphthalein titration. Then if C represent the phenol titration, B dimethyl, and A nitrogen equivalent, $\frac{C-B}{A}$ is a constant. This figure, multiplied by 10, is called the *nitrogen factor*, and is found to be uniform in normal persons. The nitrogen estimation and the determination of the nitrogen factor, give an index to the amount and character (degree of digestion) of the products of digestion.

Singer[4] discusses the relation between sodium chloride and acid chlorides in gastric juice. He endeavoured to ascertain the amount of sodium chloride present in pure gastric juice in the absence of a test meal. Cats were used, and it was found that the organic chloride is largely conditional upon secretory or osmotic processes in the stomach wall. The conclusion is that variations in this amount must be reflections of pathological changes in the stomach.

URINE.—The substances to look for in cases of cancer are grouped together by Davis,[5] who discusses the subject of *hæmo-urochrome*. This substance is found in urine in a large number of cancer cases, and is tested for by adding 10 c.c. of hydrochloric acid to 10 c.c. of urine, boiling, cooling, and adding 30 c.c. of ether. The mixture is occasionally agitated, and the ether poured off in two hours into a white dish. When the ether has evaporated, the colouring matter is left on the dish. On addition of a small quantity of 1 per cent sodium bicarbonate, the colouring matter goes into a solution, to which methyl violet (·05 per cent) can be added. The blue tint should turn red. [It is evident from reading this paper that the new substance so-called is nothing more than a bile-pigment derivative, although it is stated that the amount present bears a distinct relation to the extent of the disease in cases of cancer.—O. C. G.]

Colloidal nitrogen is in excess of the normal (3·42 per cent) in cancer cases. According to Salkowski and many others, if the value rises to 6 or 7 per cent, it is considered to be indicative of cancer.

Method.—Remove albumin by boiling. Slightly acidify, filter, and estimate the total nitrogen by Kjeldahl's method. Evaporate 100 c.c. of the same urine to 10 c.c., cool, and add 10 c.c. absolute alcohol. In several hours filter and wash with alcohol, dissolve the precipitate in hot water, and Kjeldahlize again. The difference gives the colloidal nitrogen.

Sulphur-containing oxyproteids are increased in the urine in more than 70 per cent of cancer cases, according to Salomon and Saxl (Davis, *ibid.*).

The salicylate test of Salomon and Falk consists in washing out the stomach, and then giving 3 grams of sodium salicylate as an enema. As soon as the drug appears in the urine, wash out the stomach again. If the drug is in the gastric contents also, the case is most likely to be one of cancer.

FÆCES.—Bardachzi[6] refers to the examination of stools for *occult blood*. There may be no reaction in cases of extreme stenosis of the pylorus, but this constitutes the only exception. Ninety to 95 per cent of cases yield blood in the stools if carefully searched for. In Vay's method the excretions are rubbed into a paste and allowed to stand. Then take half a porcelain dishful and add one-third volume glacial acetic acid. Boil three minutes, cool, add 4 c.c. of ether, shake several times, centrifuge. Collect the extract on a dry filter. Then mix the filtrate with 2 c.c. of 3 per cent peroxide of hydrogen freshly prepared and alcohol benzidin. The patient must not have taken meat or soup for three days.

BLOOD SERUM.—*Complement Deviation and Complement Binding.*—Schenk[7] says the v. Dungern method of sero-diagnosis of malignant disease is not very reliable. A positive reaction must be interpreted with caution, as even normal sera may contain lipoids that will react, while syphilis and tubercle may yield potent substances. But it is not considered that the latest modification of all is of much value, and indeed it may be assumed that the number of modifications that appear in the journals each successive week are sufficient evidence that the process is not worthy of the time expended upon it. It is significant that the antigens successively employed are widely different. Thus we have, in succession, advocacy of (1) aqueous extracts of tumours; (2) ethereal extracts of tumours; (3) alcoholic extracts of normal human blood; (4) acetone extracts of normal human blood.[8] Further, a positive reaction may be obscured by the presence of too much complement. More recently it has been advised to heat the serum to 56° after adding soda, v. Dungern believing that this method renders the risk of mistaking tubercle and syphilis quite negligible. Petridis[9] obtained good results in the diagnosis of cancer of the stomach by a special modification of v. Dungern's method.

REFERENCES.—[1]*Med. Chron.* 1913, July, 161; [2]*N.Y. Med. Jour.* 1913, ii, 113; [3]*Quart. Jour. Med.* 1913, July, 295; [4]*Lancet*, 1913, i, 1093; [5]*Amer. Jour. Med. Sci.* 1913, i, 845; [6]*Wien. klin. Woch.* 1913, 1531; [7]*Wien. klin. Woch.* 1913, 1544; [8]*Berl. klin. Woch.* 1913, 1181; [9]*Münch. med. Woch.* 1913, No. 2.

CATARACT.

A. Hugh Thompson, M.D.

Prognosis.—*Statistics of Vision after Operation.*—A comparatively small number of cases carefully followed up will give more valuable information than a larger number less carefully observed. Temple Smith[1] gives the final visual results of 50 cases operated on in private: $\frac{6}{6}$, 2 cases; $\frac{6}{9}$, 2 cases; $\frac{6}{12}$, 11 cases; $\frac{6}{18}$, 18 cases; $\frac{6}{24}$, 3 cases; $\frac{6}{36}$, 6 cases; $\frac{6}{60}$, 5 cases; less than $\frac{6}{60}$, 3 cases (one required needling, the other two had myopic fundus changes, but could see to get about, though not to read). An iridectomy was performed in all; in a few as a preliminary measure. In the last 23 cases, irrigation of the anterior chamber was done with 0·7 per cent saline. These results, though not brilliant, are probably a more reliable guide to the prognosis of an average case than the more optimistic figures of some writers. No case of suppuration occurred in this small series; but that does not mean necessarily that there was no sepsis, as there were 6 cases of iritis.

Treatment.—**Antiseptics.**—Temple Smith, following the teaching of Elliot, of Madras, and other Indian operators, washes out the conjunctival sac just before the operation with 1-4000 perchloride of mercury lotion. In Madras, Elliot uses 1-3000. This generally causes a mucous secretion, which is mopped away with sterile swabs, and the sac is freely washed out with saline. Since this practice has been adopted, the percentage of suppuration, which was formerly 3·2 per cent in Elliot's clinic, has been reduced to nil. The disadvantage of the method is that after the douching with the strong antiseptic, the eye becomes red and angry-looking, and one has to operate on it in this condition. In India, where the condition of the lids is often very bad, the procedure appears to be justified. The practice of European operators may be compared with the above. Axenfeld,[2] of Freiburg, always makes a bacteriological examination of the conjunctival sac before operation. When he finds pneumococci, he treats the conjunctiva for four or five days by douching three times a day with pyocyanase or perhydrol (0·25 per cent). Further, on the night preceding operation, the patient is given an injection of Kolle's or Römer's antipneumococcic serum. Elschnig, of Prague, also takes a smear from the conjunctival sac before operation in all cases. If it shows pneumococci or streptococci, hourly douchings with 1-5000 oxycyanate of mercury are employed, and the lacrymal sac is washed out daily. Most other operators on the Continent, as in England, consider it safe to operate in the absence of conjunctivitis or duct trouble without a special bacteriological investigation, and for douching use weak saline. Fuchs, for instance, only employs weak perchloride for special cases.

Intracapsular Extraction.—The controversy over Smith's operation continues, chiefly in the columns of the *Indian Medical Gazette*; but very little fresh light has been thrown upon it, and in England it is only exceptionally performed. Nesfield[3] advocates a modification of the operation, which consists in dividing the lower fibres of the suspensory ligament prior to expression of the lens. It is these fibres which, if they are intact, prevent the lens coming out whole in its capsule without the exercise of an amount of pressure which may be dangerous. This division is effected by means of a silver wire hook passed into the anterior chamber. It is four inches long, and as stout as a darning-needle. The end introduced into the eye is bent at a right angle, the bent portion being ¼ in. in length; the angle must be flattened, and the end polished quite smooth. This instrument is introduced as far as the lower border of the lens. Its point is then turned downwards and made to circuit the lower half of the lens margin. The advantages claimed by Nesfield are, that it is far easier than the method of external pressure for rupturing the suspensory ligament, that it reduces the amount of pressure exercised on the vitreous to a minimum, and that it permits the employment of a sclero-corneal incision, so that a small peripheral iridectomy can be done instead of the usual central one which destroys the circular pupil.

In criticism of this paper, Strother Smith[4] (Allahabad) writes that "Nesfield's dislocator" implies the passing of an instrument between the iris and the lens, practically without touching either, as if the iris is touched the patient is very liable to wince and thus complicate the proceeding. If the lens is touched with the slightest weight, in many cases the capsule will be lacerated. The wincing of the patient is also very liable to cause the laceration of the capsule. When the instrument has been got into position to sweep round the suspensory ligament, have we any guide to indicate where that position is? We are working in the dark. It may be on the lens; it may be on the suspensory ligament; it may be up against the ciliary region, in which case the patient will certainly wince and complicate matters." Strother Smith considers it supremely complicated and difficult, much more so than dislocating the lens by external manipulation.

REFERENCES.—[1]*Austral. Med. Gaz.* 1912, 648; [2]*Ophthalmoscope*, 1912, 36; [3]*Ind. Med. Gaz.* 1912, 382; [4]*Ibid.* 1913, 143.

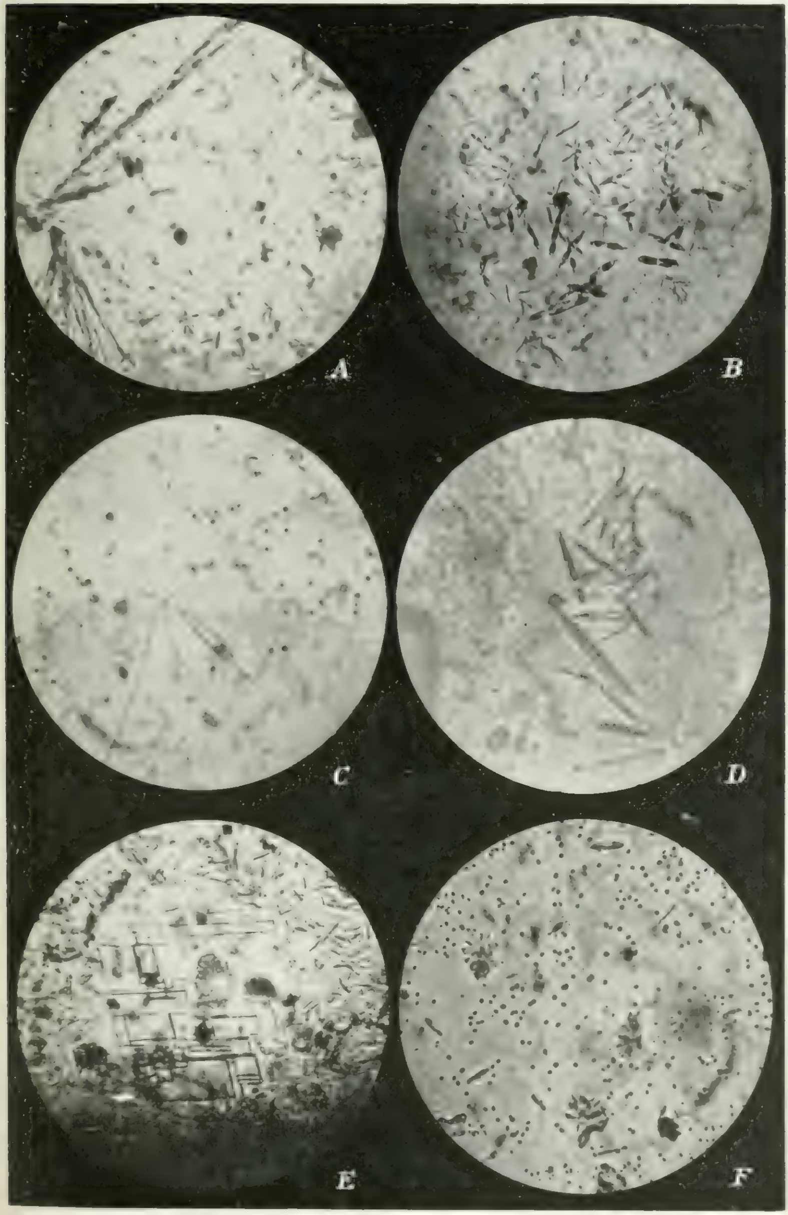
CATARACT, PATHOLOGY OF.

J. Burdon Cooper, M.D., B.Sc., D.O. Oxon.

These researches originated in the discovery by the author of the amino-acid *tyrosin* in the aqueous humour, following a discission for high myopia, as far back as 1900. The aqueous humour from this case was found crystallized after it had been preserved for a time in a sealed tube, and tyrosin was detected among the crystals of phosphate and chloride of sodium which constitute the major part of the crystalline content of the aqueous. In seeking to account for the presence of this body, which was decidedly unusual, it was found that the crystalline lenses of the lower animals and the human lens, as well as the hair, nails, and enamel of the teeth, structures which are developmentally related to the lens as having the same epiblastic derivation, all yielded tyrosin on hydrolysis with a weak acid. It was therefore concluded that the change which had been produced in the clear lens by needling it, was one of hydrolysis of the lenticular proteid, with the production

PLATE XI.

TYROSIN AND CHOLESTERIN IN CATARACTOUS LENSES

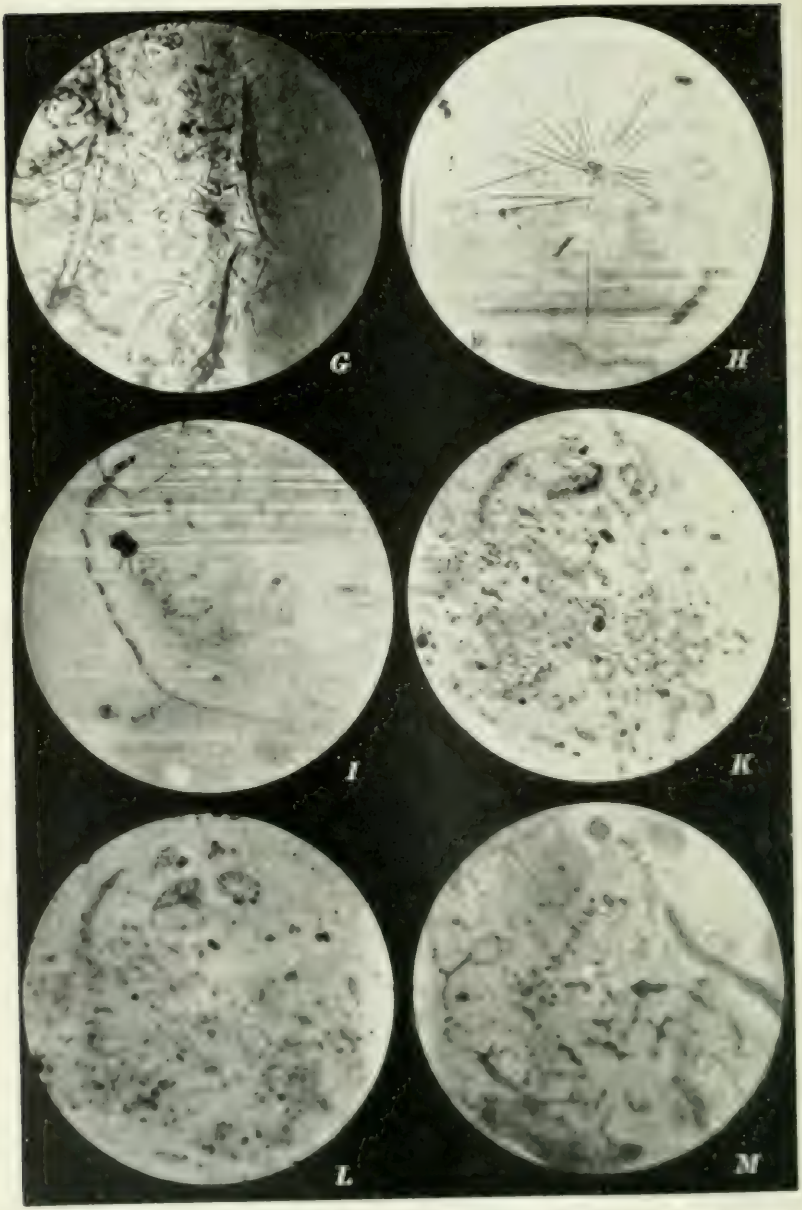


Photographs [illegible]

[illegible]

PLATE XII.

TYROSIN AND CHOLESTERIN IN CATARACTOUS LENSES



of tyrosin. This, it is believed, is what actually takes place. The opacity produced is finally got rid of by solution of its soluble constituents.

Having come to this conclusion, attempts were made to apply it to the investigation of the changes in senile cataract. The aqueous and lens were preserved and examined in every case of cataract operated on, and as a result of this examination of several hundred cases, including preliminary iridectomies, it has been satisfactorily shown that when the lens was cataractous, tyrosin was present in it, and also in the aqueous humour. The only logical conclusion which could be drawn was, that the cataractous change in the lens was a hydrolysis. Simple hydration will not account for such products as tyrosin and cholesterin ; and the old theory of dehydration, which is still taught, is untenable for many reasons which need not be given here. Cases of myopic degeneration of the lens, which are well known now, seem absolutely to veto this theory.

The examination of the lens and aqueous in cataract associated with albuminuria and glycosuria has given very interesting results. In the former, tyrosin is very greatly in evidence both in the lens and aqueous, and the greatest quantity of tyrosin found in the aqueous in any single case occurred in an albuminuric (*Plate XI*, *Figs. A*, *B*, *C*, and *D*). No evidence of crystallized cholesterin was found in these cases. Without going into reasons here, the writer concluded that this tyrosin was derived solely from the lens, and was not the product of the decomposition of albumins. Interesting in this connection is the part played by the kidney in senile cataract. The specimens (*Figs. A*, *B*, *C*, and *D*) show a great increase of tyrosin in the lens and aqueous, above that which is found in cataract where there is no clinical evidence of renal insufficiency. These findings have an important bearing on the question of this relation of the kidney to senile cataract, and furnish strong evidence that such a relation exists. The suppositions which exist as to the character of this relationship at present are only speculative ; but an enquiry into this would probably lead to valuable results.

In cataract associated with glycosuria, in addition to tyrosin in both aqueous and lens, there was a large quantity of *cholesterin*. The specimen shown in *Plate XI*, *Fig. E*, shows both tyrosin and cholesterin existing together in a cataractous lens. Cholesterin is met with fairly frequently in the lens ; it is doubtful whether it has ever been demonstrated as associated with tyrosin before. If it is correct to look upon tyrosin as an indicator of a process, the nature of which is believed to be simple hydrolysis, then cholesterin is indicative of some change the nature of which still awaits solution, though it has been known so long as a fairly frequent constituent of the cataractous lens.

In *Plates XI*, *XII*, *Figs. F* and *G*, tyrosin is seen existing in the aqueous and also in the lens in a case of cataract with glycosuria in a patient aged seventy. *Plate XII*, *Fig. H*, shows tyrosin produced from the human lens by artificial hydrolysis with weak acid. *Figs. I*, *K*, *L* show the method of demonstrating tyrosin in the aqueous by breathing on the slide; the sodium chloride being hygroscopic, dissolves, and shows up the relatively insoluble tyrosin. *Fig. K* shows a slide not breathed upon while in *Fig. L* the stellate form of the crystal shows up quite clearly.

It ought to be noted that the specimens have not been touched in any way or by any chemical; they are from lenses and aqueous direct from the eye, and photographed within two hours in the majority of cases. This hydrolysis theory of cataract accounts for the presence of tyrosin in the aqueous after discission of the clear lens, and also in the aqueous and lens in senile cataract. It accounts for the findings in albuminuria and glycosuria. It is the only theory which accounts for the pathology of black cataract and pigmentation of the lens generally. It accounts for the diminished weight of the cataractous as against the clear lens of the same age; and for the diminished rate of growth preceding the formation of cataract. It explains the more frequent position of the opacity in the cortex because it hydrolyses more readily than the nucleus. Finally, it fits in with Prof. Dor's observation that in cataract the lento-albumin is very much less, and generally disappears, because it is being hydrolyzed and carried away as tyrosin.

Fig. M shows tyrosin in the lens in senile cataract.

CEREBROSPINAL FEVER.

E. W. Goodall, M.D.

SYMPTOMS.—A. H. Parmelee[1] of Kansas City, has published the results of a careful study of 230 cases. The onset of the attack was sudden in 85 per cent; the temperature reached 100° to 102·5° F. in 50, and over 102·5° in 33·5 per cent; the pulse was slow in 53 and rapid in 47 per cent. In 53·5 per cent there was delirium, and in 60 per cent unconsciousness. Headache was present in 84 per cent. In 96 per cent rigidity of the neck was observed, and in 84 per cent set in early, while in 4 per cent it was absent. Kernig's sign was present in 91 per cent. Convulsions occurred in 21 per cent, vomiting in 76 per cent, herpes in 60 per cent, and petechiae in 24 per cent. In 27·5 per cent of the cases there was strabismus, and in 52 per cent the pupils were unequal; 50 per cent of the patients were hyperaesthetic, and retention of urine occurred in 17 per cent. In 33 per cent the number of leucocytes in the blood was from 15,000 to 25,000 per c.mm., and in 52 per cent it was over 25,000. In 6 per cent of the cases the spinal fluid withdrawn by lumbar puncture was clear at the first, but cloudy at subsequent punctures; in only 1·8 per cent could meningococci not be demonstrated in the fluid at the first puncture, while in 2·3 per cent they were not found at any puncture. Relapses took place in about 3·7 per cent; nearly 8 per cent of the patients were deaf, and in nearly 8 per cent arthritis occurred; in about 3 per cent hydrocephalus ensued.

A somewhat similar account of the disease has been furnished by F. J. Slataper, of Houston, Texas, from an analysis of 110 cases. He states that in 10 per cent there occurred, as an early symptom, a subcuticular mottling that quickly covered the entire body, and after a few hours disappeared as suddenly as it came out. In 8 per cent of his cases the disease set in with the signs and symptoms of acute pneumonia. Herpes labialis was present in 58 per cent, and a petechial rash in 78 per cent. Relapses occurred in 17 per cent, arthritis in 14 per cent, and bronchopneumonia in 58 per cent. In 6 per cent the disease became chronic. This writer mentions two forms of Kernig's sign: when the patient cannot extend his own leg on the thigh, which is held at right angles to the abdomen, it is said to be "active"; it is "passive" when some one else cannot extend the leg. Kernig's sign may be reinforced by holding the chin flexed toward the chest while the test is being conducted in the usual manner.

DIAGNOSIS.—H. Koplik[3] points out the difficulty in the diagnosis of cerebrospinal fever in children under two years of age. "Particularly difficult are the cases in infants which are complicated with a pneumonia. Many cases of pneumonia are complicated with cerebral symptoms; there is the restlessness, rigidity, retraction of the head, and the fever, which continues a long time past the initial phase of the disease. Again, there are in young infants a number of cases in which the initial symptoms of fever and restlessness are not combined with other symptoms, such as rigidity. . . . Many diseases of infancy, even a simple intestinal disorder, are so often combined with milder forms of cerebral symptoms, that we can easily explain how a meningitis in younger children and infants is often overlooked. The physician is alive to the presence of a "Kernig,' but this is certainly absent in many infants, and is of little value in the diagnosis of meningitis. . . . The stress of diagnosis must be placed on the persistence of cerebral symptoms, high fever, and, what is of greatest import and scarcely appreciated at its full value, Macewen's percussion note over the fronto-parietal junction as a sign of increasing fluid in the head." This writer is of opinion that in infants, lumbar puncture for the purpose of diagnosis should be performed early, even on the suspicion of cerebrospinal fever, because of the great danger there is in delaying, even for a day, the injection of the specific serum. In older children a day's delay is not dangerous. "Quite early, at the outset in many infants, the subarachnoid space at the base of the brain is cut off from that of the cord, with the result that lumbar puncture with introduction of serum becomes fruitless quite early—on the second or third day of the disease in some infants."

TREATMENT.—Koplik also insists upon the necessity for withdrawing the cerebrospinal fluid and injecting the curative **Serum** very slowly and cautiously in infants under two.

J. R. Charles[4] records three very severe cases, in two of which recovery took place, after treatment by intraspinal injection of Flexner's serum (15 to 30 c.c. daily) and **Urotropin,** 10 gr. every four hours.

The **Intraspinal Injection of Serum** has in a few instances been attended with immediate, severe, and in some cases fatal results. These have been attributed to four different causes, viz., the phenol which has been added to the serum as a preservative, anaphylaxis, rapid lysis of the meningococci by the serum, and excessive intracranial pressure. These causes are discussed in detail by Simon Flexner.[5] He shows that the phenol can be absolutely acquitted, that hardly any case can be made out for the theory of lysis of the cocci, that anaphylactic shock is very rare, but that in most of the instances the untoward event can be put down to sudden increase in intracranial pressure. Usually respiration has failed before the heart has ceased to beat, and artificial respiration has frequently restored the patient. Lately the practice has been to give considerably larger injections of serum than was formerly the case, and the danger of increased pressure has been forgotten, because of the infrequency of the occurrence with smaller quantities. The serum should therefore be allowed to enter the spinal canal by gravity rather than by the force of the syringe. By this method it can be introduced slowly, and, moreover, the fluid can be immediately withdrawn at the first sign of respiratory embarrassment. Flexner speaks with approval of Sophian's method, described in the last volume of the ANNUAL, in which the registration of the blood-pressure supplies an ocular guide to the injection of the serum by gravity. His paper has appended to it a number of useful references.

PROPHYLAXIS.—In the last volume of the ANNUAL an account was given of the vaccination of eleven adults against cerebrospinal fever by Sophian and Mack. Eleven months after these vaccinations Mack[6] tested the immunity of eight of these persons, and compared their blood with that of a normal person, and also that of a patient who had just recovered from a severe attack of cerebrospinal fever. He finds that prophylactic vaccination produces a high degree of immunity in most cases, this immunity being demonstrable at the end of one year. It seems a justifiable conclusion that most individuals prophylactically vaccinated may safely consider themselves immune for at least one year. Exceptions to this will, of course, be found. Some individuals may show an actual increase in immune bodies at the end of one year over those demonstrable soon after vaccination. Fixation of complement occurred with the serum of the positive control who had recovered from meningitis, but this fixation did not reach as high dilutions as did that of some of those vaccinated. This has previously been found in some others recovered from the disease. Mack thinks that experimental evidence warrants the conclusion that prophylactic vaccination is a measure of the greatest value in the control of epidemic meningitis.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1914, i, [illegible]; [2]*N.Y. Med. Jour.* 1914, i, [illegible]; [3]*Jour. Amer. Med. Assoc.* 1913, ii, [illegible]; [4]*Bristol Med.-Chir. Jour.* 1914, 142; [5]*Jour. Amer. Med. Assoc.* 1914, i, [illegible]; [6]*Ibid.* [illegible].

CEREBROSPINAL FLUID. (*See also* SYPHILIS, CEREBROSPINAL.)

[illegible] C. Gruner, M.D.

The analysis of cerebrospinal fluid should take into consideration its quantity, clearness or turbidity, presence or absence of albumin and globulin, capacity for reducing Fehling's solution, and cytology. It is convenient to divide the different fluids into those that are clear and those that are turbid. According to Hutinel and Lederer,[1] clear fluids are found in tuberculous meningitis, in cases of meningismus, (especially pneumonic), typhoid fever, in nephritis with uræmic symptoms, and in syphilis. Turbid fluids are found in cerebrospinal fever, pneumococcic meningitis, poliomyelitis and polioencephalitis, and in the meningitis secondary to ear disease. The characters of the tuberculous fluids are—formation of a flocculus, positive Heller test for albumin, negative reaction to Fehling's, and lymphocytosis. Tubercle bacilli are present. Globulin is present in both tuberculous and cerebrospinal meningitis. In the latter disease, of course, the deposit contains pus. These authors found the commonest organism of cerebrospinal fluid to be *Streptococcus pyogenes*.

Albumin Content.—Sicard and Foix[2] place 2 c.c. of the fluid in a test tube and add 6 to 7 drops of fuming nitric acid. An *immediate* precipitate is interpreted as follows: Opalescence (first degree) occurs in healthy fluid, and in Pott's disease that has been cured. The second degree, consisting of fairly rapid opalescence increasing on standing, no cellular exudate being present, occurs in cases of slight compression of the cord. The third degree, immediate turbidity with very few cells, means compression from without the cord (e.g., early Pott's disease). In the fourth degree—yellowish discoloration with a heavy clot—a moderate number of cells means greater compression and even pachymeningitis. The more albumin and the more cells, the more likely is the lesion to be in the pia mater.

Greenfield[3] considers that a high albumin content indicates operative treatment. In his study of the fluid he used Noguchi's butyric test.

The *tests for albumin* are as follow: (1) Nonne's Phase 1 test; mix equal parts of the fluid and of ammonium sulphate (saturated while hot and then cooled). Turbidity means that albumin is present. (2) Nonne's Phase 2 reaction, is as the preceding, but acetic acid is added. Turbidity may now appear in normal states. (3) The Ross-Jones test is a ring test with ammonium sulphate. (4) In Noguchi's test, to 2 c.c. fluid are added 5 c.c. of 10 per cent butyric acid. Boil, add 1 c.c. normal soda (7 per cent), and boil again; a precipitate indicates the presence of albumin. (5) Kaplan's Test. Into successive tubes place ·5, ·4, ·3, ·2, and ·1 c.c. of fluid. Make all up to ·5 c.c. with distilled water. Boil each, and add 2 drops of 5 per cent butyric acid. Boil again, and underfloat 5 c.c. of super-saturated ammonium sulphate in each tube. Look for a thick cheesy ring in twenty minutes. (6) The colloidal gold chloride test (Lange) is described by Grulee and Moody.[4] The test solution consists of 500 c.c. of freshly doubly distilled water, heated to 60° C., 5 c.c. of 1 per cent gold chloride, immediately followed by 5 c.c. of 2 per cent potassium carbonate. The mixture is brought to a boil, and 5 c.c. of 1 per cent formalin are added quickly. Shake well. The solution should come out red with a tinge of yellow, and be absolutely clear. Into a test tube place 1·8 c.c. of 10 per cent sodium chloride. Into nine other tubes place 1 c.c. of 1·4 per cent sodium chloride. To the first tube add ·2 c.c. of cerebrospinal fluid, mix well, take out 1 c.c. and place into the second tube, and repeat in the same way for all the others. To each tube add 5 c.c. of the test solution and allow the tubes to stand for twenty-four hours. A precipitate constitutes a positive reaction. The precautions necessary are absolute cleanliness of glassware, absolutely pure water, no rubber connections, and great care in lumbar puncture.

The Fehling Test.—Without considering the nature of the substance that gives the reaction, its presence or absence remains of significance in the diagnosis of certain conditions (Jacoby[1]). Equal parts of the fluid and the test solution are boiled in a narrow tube and allowed to stand for an hour. A marked yellow deposit constitutes a positive reaction. It is absent in pneumococcic, streptococcic, and mixed infections in acute stages of cerebrospinal fever; present in tuberculous meningitis and poliomyelitis. If found in cases of cerebrospinal fever it means progress towards cure.

Cytology.—Roger[6] recommends Nageotte's chamber. He mixes the fluid with Unna's blue or crystal violet. The centrifuge must not be used. The maximum number of cells per c.c. in normal fluid is 2. From 2 to 4 are found in syphilitic cases; above 4 in varying degrees of leucocytosis. (N.B.—The tendency which leucocytes have to adhere to glass must be taken into consideration.—Greenfield). Plasma cells indicate syphilitic meningitis according to Jeanselme and Chevallier. A preponderance of lymphocytes occurs in an obsolete meningitis or parasyphilis; large lymphocytes with plasma cells and occasional polynuclears in acute or incipient meningitis; abundance of polynuclears in acute meningitis.

Biological Tests.—Roger[6] refers to examination for trypanosomes and for Wassermann reaction. A new test by Maruyama[7] is used for cases of general paralysis, and based on an anaphylactic process. It is performed as follows: ·02 c.c. human serum is injected subcutaneously into a guinea-pig. In two or three weeks the cerebrospinal fluid of the patient is injected intravenously, using 1·5 to 2 c.c. per 100 grams weight of animal. If the disease be present, the animal dies with spasms within a few minutes. In the case of other psychoses the animal does not die.

Drug Test.—The detection of potassium iodide or nitrates in the cerebrospinal fluid has been utilized for diagnosing acute inflammation. They do not appear in chronic cases (Roger[6]).

Anthrax bacilli were found in a case of internal anthrax by Pollak.[8]

The signs of syphilitic infection in cerebrospinal fluid are (1) Lymphocytosis. (2) Hyper-albuminosis. (3) Wassermann test positive in the blood. (4) The same in the fluid. If the third is present without the other three, the case is certainly not one of syphilis of the nervous system. If all four are positive the case is very severe. The first two with fourth indicate a severe degree of affection of the meninges. A positive gold-chloride reaction (see above) is of use in diagnosing congenital syphilis (Grulee and Moody[4]).

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1913, i, 811; [2]*Presse Méd.* 1912, 1013; [3]*Lancet,* 1913, ii, 669; [4]*Jour. Amer. Med. Assoc.* 1913, ii, 24; [5]*Brit. Med. Jour.* 1912, ii, 1297; [6]*Presse Méd.* 1913, 103; [7]*Wien. klin. Woch.* 1913, 1241; [8]*Ibid.* 1912, 1109.

CEREBROSPINAL SYPHILIS. (*See* SYPHILIS, CEREBROSPINAL.)

CHLOROMA. (*See* LEUKÆMIA.)

CHOLERA. *Leonard Rogers, M.D., F.R.C.P.*

E. D. W. Greig[1], [2] has been on special duty in Calcutta investigating the *epidemiology* of cholera, and has obtained the following important results. During a serious epidemic at the Jaganath Car Festival at Puri, he made cultures from the gall-bladder in 271 fatal cases, and isolated the vibrio in no less than 81, while in 12 naked-eye changes were found in the wall. In one patient, who died of uræmia on the thirteenth day, these were particularly well marked, while vibrios were also found in the lung, so he suggests that late deaths may be partly due to toxins of comma bacilli which have gained a footing in the gall-bladder or tissues. Further, in no less than 36 per cent of recovered patients, comma bacilli were found in their stools at the time they were discharged from the hospital, to be widely scattered over India by the railway. As upwards of 150,000 pilgrims were present at the festival, it was not surprising that the disease was spread by them over the Central Provinces and other areas. In 2 convalescents he found cholera organisms in the stools thirty and forty-four days respectively after the acute attack. Again, out of 27 healthy people who had been in close contact with cholera patients, 6 were excreting cholera vibrios in their stools, and were thus potential carriers of the infection. The serum of convalescent cholera carriers was found to agglutinate the organisms, while those who did not continue to excrete vibrios did not show agglutinins in their blood. The Widal test may thus prove to be a means of detecting cholera carriers more easily. An outbreak was produced in the Puri gaol by the admission of a man recently convalescent from cholera, who was proved to be a "carrier." Flies caught in the vicinity of cholera patients were found to have vibrios on their appendages and in their alimentary canals. He thinks water could be excluded as a source of infection at Puri. As a preventive measure the stools of all the inmates of the gaol were disinfected with cyllin, and four days after, the outbreak ceased. The disinfection of the fresh night-soil of the town was then carried out by means of a solution of fresh chlorinated lime, which is cheap, a good bactericide, and by its odour a check to flies. In spite of private privies escaping the measure, the epidemic rapidly subsided; it appears to have already been on the wane when the disinfection was started, but this method is worthy of further trial.

R. Kraus[3] and his colleagues report on their experiences of cholera in the Bulgarian army during the recent war. Doctors and nurses were deficient, and 1840 deaths occurred up to the end of November, 1912. It was partly explosive water-borne disease, and partly sporadic, due to carriers and mild unrecognized cases, carriers forming 4 per cent of those examined. Nine bacteriological stations were formed, stretching from the fighting line to Sofia. Men were made to take an oath to drink only boiled water. Special infectious hospitals were erected, and suspicious cases separated from the wounded, sporadic cases being thus eliminated. As it was impossible to find all the carriers, contact infection could not be entirely prevented, and Kolle's dead vaccine was largely used for inoculating the wounded. Rogers' **Hypertonic Saline** treatment was tried. It had no visible effect in the most acute cases which die in a few hours, but in some severe cases rapid improvement was noted. **Tinct. Iodi** in 3- to 5-min. doses three times a day had a beneficial effect in cases of diarrhœa but was not tried in cholera.

TREATMENT.—R. Emmerich[1] gives an account of hypertonic saline treatment, and states that absorption of nitrites causes the fall of blood-pressure by paralyzing the blood-vessels, and also causes uræmia by producing necrosis of the renal epithelium. He goes on to consider the action of permanganates in destroying the nitrites in the bowel in cholera, and gives evidence to show that free permanganous acid is converted in the stomach and intestine into colloidal supermanganous superoxyhydrate, and this colloidal MnO_2 neutralizes the fearfully toxic action of the nitrites. **Colloidal Permanganate** is easily and cheaply prepared by the action of potassium permanganate on gelatin. He considers that the striking specific action Rogers obtained in cholera with permanganates must be due to the transformation of nitrites into the harmless nitrates in the intestine, and the earlier it is used the better. He does not, however, recommend it as prophylactic, for which purpose he advises the administration of amidosulphonic acid as a 10 per cent solution in small quantities, or better, free drinks of a 1–1000 solution, which can be supplied in a pure state by Dr. Raschig, of Munich. He thinks the permanganate treatment the most important yet produced in cholera therapy. [The writer has tried colloid permanganate kindly sent him by Professor Emmerich, and found it to have the great advantage of being practically tasteless; he has used it in a few cases in children with apparently good results. Unfortunately, it is very unstable in solution, except when kept in sealed flasks.—L. R.]

J. W. D. Megaw[2] records his results in the treatment of cholera in Calcutta by Rogers' method during 1911. As he had also been in charge of the cholera ward in 1905 and 1906, before the introduction of the new methods, he was in an exceptionally favourable position to compare the results during the two periods. In former times the mortality at the Calcutta Hospital has been found to remain fairly constant at about 60 per cent over a number of years, while during the nine months under review 112 cases were treated, with 36 deaths, or a mortality of 32·1 per cent. Among 94 more serious cases requiring transfusion, the deaths numbered 35, or 37·2 per cent. The high proportion of severe cases leaves little doubt about the diagnosis, but bacteriological examinations were also made. A great improvement in the care and nursing of the patients accounts for a small proportion of the improved results. He advises early transfusion in all cases of any severity, without waiting for the blood-pressure to fall and the blood to become concentrated and charged with toxins. Prompt intravenous **Hypertonic Saline** injections maintain the circulation in the vital organs and eliminate toxins. He suggests that washing out the stomach with permanganate solutions might be an improvement on giving solutions to drink, while the permanganate pills are sometimes unsatisfactory. In some cases he found the alkalinity of the blood greatly diminished, but in that stage he found intravenous injection of alkalies was of little effect, though it might be of use earlier, as suggested by American observers. He considers the method of great value in saving life, and also in relieving much distress and suffering.

G. Duncan Whyte[6] records a study of 215 cases of cholera treated with hypertonic intravenous salines by Rogers' method at Swatow, in China. As a rule permanganates were not administered, as in a few cases in which they were tried they seemed to increase the vomiting and discomfort of the patient. He emphasizes the simplicity of the method. In taking the specific gravity of the blood, he uses only two bottles, of 1062 and 1066 respectively, and prefers a mixture of castor or olive oil with oil of wintergreen, for the blood does not mix with this as it does with glycerin and water. The result must be corrected for temperature, and the oils made up every few days, as the oil of wintergreen is the more volatile. If the drop of blood rises briskly in the 1062 bottle, transfusion is not required. If it floats or sinks slowly, 80 oz. of saline should be given, while if it also sinks in the 1066 one, 120 oz. should be given at once. A blood-pressure of 70 mm. or less was also taken as an indication for transfusion, as advised by the originator of the method. The simplicity of the treatment is borne out by the fact that the first 500 cases were treated in their houses, and in not a single case did thrombosis or embolism occur.

A boiled 2 per cent solution of β-eucaine produced a satisfactory local anæsthesia. The internal saphenous vein over the internal malleolus was usually selected, or one of the veins on the back of the hand. Out of a large number of cholera cases in which the blood-pressure did not fall below 70 mm., every one recovered. Of 215 cases with lower blood-pressure treated with intravenous infusion, 150, or 70 per cent, recovered. No case was refused treatment, and no deaths occurred which are not included in the above figures. The cause of death was collapse in only 5 per cent. The more acute the onset, the more likelihood of sudden collapse occurring, a few cases being too virulent to be saved. **Pituitrin** and **Adrenalin Chloride** were also used, and appeared to be of service. When there was difficulty in giving nourishment owing to persistent vomiting, dextrose was dissolved in the saline to sustain the strength. About half the deaths were due to hyperpyrexia. By taking the rectal temperature, and if it was high, giving the infusions below blood-heat, as advised by Rogers very few developed hyperpyrexia. Almost all the deaths in children, and most in those over 40, were due to this cause ; in both classes of patients they recommend that the inflow of saline should be slower, and the quantity regulated by the age, sex, and weight of the patient, as well as the specific gravity. To free the saline from organic matter, it should be passed through a Berkefeld or Pasteur filter before use. To prevent hyperpyrexia, frequent observations of the rectal temperature must be made and prompt measures taken if it reaches 104° F., **Iced Rectal Salines** being the best, together with cold sponging. Uræmia caused 7 per cent of deaths, mostly in patients over 50, only one being under 40 years of age. Extract of **Apocynum Cannabinum**, in 2-min. doses every three or four hours, was found best for raising the blood pressure in this stage. For diluting the blood in threatening uræmia, normal saline (60 gr. of sodium chloride to the pint) intravenously, and sterile water per rectum are good, the latter being given twice daily. **Dry Cupping** over the kidneys was also used. He disapproves of Sarkar's (see below) suggestion, habitually to use vasodilators in uræmia, on account of the dangerously low blood-pressure associated with the disease.

G. B. Sarkar[7] agrees as to the great value of hypertonic salines in treating the collapse stage of cholera. He discusses at length the condition of post-choleraic uræmia, urging that the danger is increased by vasoconstrictors, such as adrenalin, digitalis, and caffeine, and advising the opposite line of treatment, i.e., the use of nitrites to dilate the renal vessels, for which he claims good results. [This is contrary to the writer's experience, although he is inclined to think, as a result of long trial, that **Potassium Citrate** is useful in checking the diminished alkalinity of the blood.—L. R.]

REFERENCES.—[1]*Lancet*, 1912, ii, [illegible]; [2]*Ind. Med. Gaz.* 1911, 8; [3]*Berl. klin. Woch.* 1913, 241; [4]*Münch. med. Woch.* 1912, [illegible]; [5]*Lancet*, 1912, i, 1424; [6]*China Med. Jour.* Mar. 1912; [7]*Pract.* 1912, [illegible].

CHOREA. (See RHEUMATISM IN CHILDHOOD.)

CONJUNCTIVA, DISEASES OF.

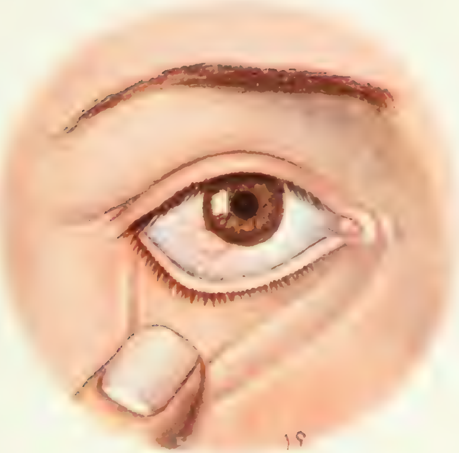
A. Hugh Thompson, M.D.

Among the poorer classes, no disease is responsible for so much damaged sight as *phlyctenular conjunctivitis*, because, in a considerable proportion of cases, it spreads to the cornea and becomes a keratitis, leaving corneal scars which in many cases become permanent nebulæ (*Plates XIII, XIV, Figs. A and C*). The disease is certainly dependent in many cases on defective nutrition; among the better-fed classes it is rare. Even among poor immigrant Jews, whose children are, as a rule, comparatively well fed, it is uncommon.

To what extent bacterial infection enters into the causation is a matter of dispute. In 1908 Nias and Paton found so close a correspondence between the rise and fall of the opsonic index for tubercle, and the development and retrogression of phlyctenules in children, that they argued that they must be of tuberculous origin. The most common organism occurring in phlyctenules, however, is the *staphylococcus*, and according to Mackay,[1] phlyctenules are a local manifestation of staphylococcic infection in a soil well suited for tuberculous cultivation. Bishop Harman found that in early cases examined by himself

PLATE XIII.

TUBERCULIN IN EYE DISEASES



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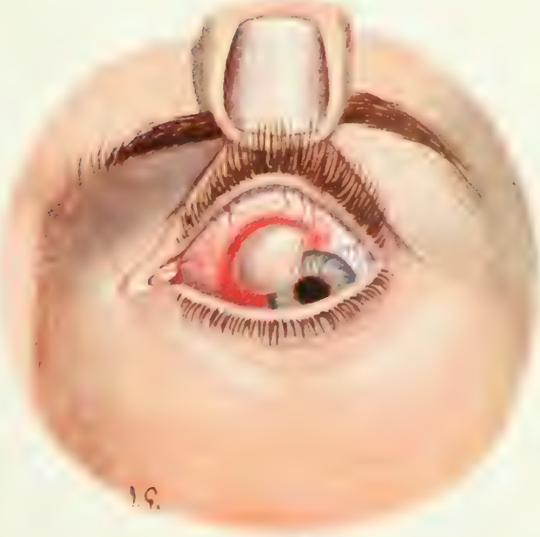

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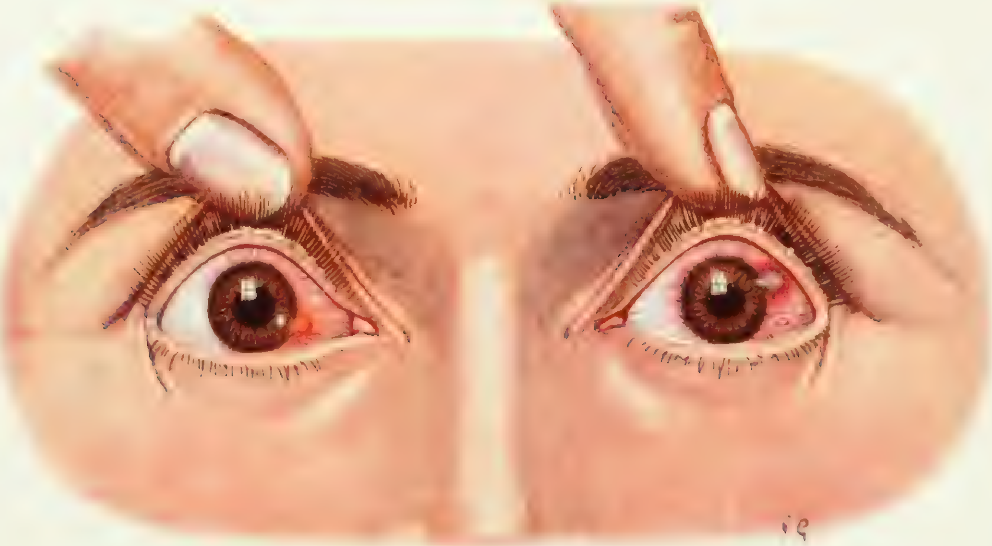
PLATE XIV.

TUBERCULIN IN EYE DISEASES



the contents of unbroken phlyctenules were sterile. He points out that the disease is most common from four to six years of age, when the milk teeth are decaying, and he looks upon it as a "herpetiform eruption caused by peripheral irritation of collateral branches of the second division of the fifth cranial nerve in ill-nourished children."[2] A theory of more complex causation, in which tubercle, malnutrition, and alimentary toxæmia each bear a part, is found in a paper by Walter, of Chicago.[3] An interesting side-light on the share played by malnutrition is supplied by Professor Straub, of Amsterdam, who determined the specific weight of normal and scrofulous children respectively by submerging them up to the neck in tepid water, measuring the volume of displaced water, and comparing this with the weight of the children. He thus found that in the great majority of cases scrofulous children have a specific weight very near that of water, whilst the specific weight of normal children is higher.[4] This difference may be ascribed to the variation in the density of the bones due to the deposit of lime salts in the bones of normal children, and the lack of such deposit in scrofulous types.

The treatment of phlyctenular disease, local and general, is well known, and in the majority of cases the immediate results are gratifying. Walter, in addition to ordinary treatment by **Yellow Ointment** and **Cod-liver Oil**, recommends the **Gastro-intestinal Treatment,** which has been practised for many years in America. It consists in the withdrawal of all cane-sugar combinations, all acids, tea, and coffee, and the sterilization of the intestinal tract by small doses of calomel continued over many days. The difficulty in these cases is, not so much to cure the particular attack as to prevent relapses. General hygiene is of primary importance.

Tuberculosis of the conjunctiva is a comparatively rare condition. When seen it is most often in the form of an extensive ulceration of the palpebral conjunctiva (*Plate XV*). "An ulcer of this description," says Ormond,[5] "hidden as it is in the loose folds of the conjunctiva, may only draw attention to its existence by a slight fullness of the lid, with watering of the eyes; when the upper lid is involved, ptosis is usually noticed. The pre-auricular gland is involved early, so that the patient, when looked at from the front, displays a putty swollen lid with a swelling in front of the tragus." Other cases are occasionally seen in which there is a pedunculated or sessile tumour of the palpebral or ocular conjunctiva. A drawing of one such is reproduced (*Plate XIII, Fig. B*). In other instances it is associated with lupus of the face. The treatment of these cases was formerly vigorous scraping or incision, "but this," says Ormond, "invariably led to severe cicatricial contraction and distortion of the lids." The surface only of the ulcer should be scraped, to remove the necrosed tissue, and for the rest, the main reliance should be placed on **Tuberculin,** an injection of ·0002 mgram being given every ten to fourteen days, the dose only to be increased if the temperature remains normal after the preceding injection. This special treatment must be combined with the general hygienic treatment of tuberculosis, and with local antisepsis, best carried out by flushing the conjunctival sac three or four times a day with iodine water.

Parinaud's Conjunctivitis.—An example of this rare disease, with an illustrative drawing, will be found in the MEDICAL ANNUAL for 1906 (*p.* 217). The involvement of the pre-auricular gland gives it a great resemblance to some cases of tubercle of the conjunctiva. According to Mollers,[6] the two diseases are identical. From two cases diagnosed as "Parinaud's conjunctivitis," he obtained tubercle bacilli which proved, on cultivation, to be of the human, not bovine, type. Both these cases were in patients infected with tubercle elsewhere in the body, and the fact that cases of Parinaud's conjunctivitis generally run a favourable course is accounted for by Mollers on the theory that the primary infection has established a relative immunity. The subject evidently requires further investigation, and as the conditions treated of are decidedly rare, it may take some time before the true connection between them is established.

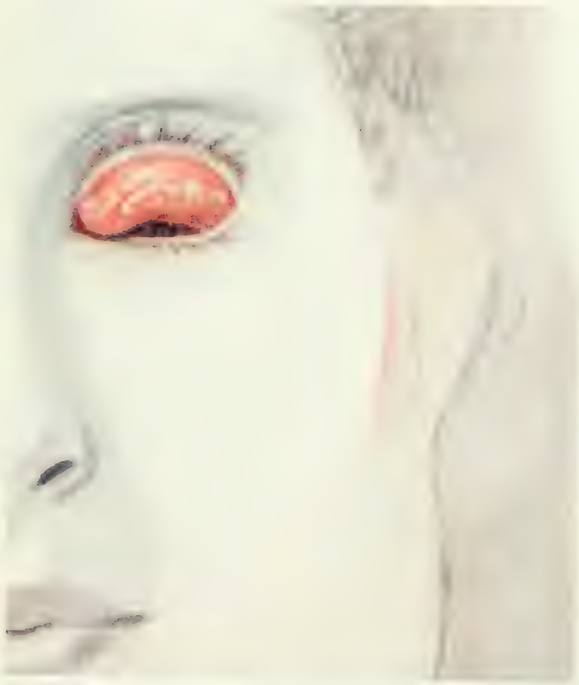
Incidence of Ophthalmia Neonatorum.—The number of cases of this disease notified to the London County Council in the first nine and a half months during which compulsory notification was in force was 673, which, compared with the number of births for the same period, gives an incidence of ·843 per cent.[7] This closely agrees with the result of a private census by Harman in 1906, who found an incidence of ·807 per cent.[8] It may therefore be said that in London the disease attacks less than one per cent of the infants born. The number of those whose sight is permanently injured appears to be about 1–20 of those attacked. Out of 251 cases occurring in the practice of midwives, and followed up by the medical officer of the London County Council, there was impairment of vision in 13, of whom 5 were completely blinded in both eyes. In 40 per cent of the cases there was a history of vaginal discharge in the mother; and of the mothers of the 13 infants whose sight was permanently injured, as many as 8 had a vaginal discharge.

This report, says Harman, and the official figures given therein, may be taken to settle once for all the question whether or no it is advisable to promote the compulsory use of prophylactic measures, i.e., the use of a silver salt or other efficient preparation immediately after birth. No legislature in the world, he goes on, would entertain for a moment an agitation for the compulsory use of a measure for the prevention of a disease to which no child need be liable, for it is not a disease which every and any one may contract, and which in London is found to affect less than one per cent of the new-born, and to injure permanently the sight of but one in two thousand. The universal application of potent antiseptics, with the possibility that they may be carelessly used, is therefore not called for. The remedy is rather to be sought, first, in efficient treatment of any vaginal discharge in the mother before delivery, and secondly, in early notification and efficient treatment of individual cases of ophthalmia neonatorum as they occur.

Swimming-bath Conjunctivitis.—In the year [illegible] a series of cases

PLATE XI.

TUBERCULOSIS OF THE PALPEBRAL CONJUNCTIVA



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resembling trachoma, but far more easily cured, was traced to infection in a Berlin swimming-bath by Schultz and Fehr. Another, though less numerous series of such cases, is related by Huntemüller and Paderstein,[9] traced to a swimming-bath, also in Berlin. As the water was changed daily, the towels thoroughly disinfected, and the bath itself thoroughly cleaned weekly, the authors argue that infection must have taken place by means of the water itself, infected on the same day. The habit of rubbing the eyes after diving may have something to do with it. Pathological examination in these cases shows that they bear a close relation to true trachoma, and it is even possible that they actually are trachoma rendered mild by prompt and efficient treatment.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, ii, 1026; [2]"Aids to Ophthalmology," London, p. 34; [3]*Jour. Amer. Med. Assoc.* 1913, ii, 1144; [4]*Ophthalmoscope,* 1912, 620; [5]*Pract.* 1913, i, 256; [6]*Deut. med. Woch.* 1912, 2059; [7]*Report of Med. Off. Health, L.C.C.* for 1911, 80; [8]*Brit. Med. Jour.* 1913, i, 1099; [9]*Deut. med. Woch.* 1913, 639.

CONSTIPATION. (*See also* INTESTINAL SURGERY, *and* VISCEROPTOSIS.)

Robert Hutchison, M.D., F.R.C.P.

The study of constipation by the aid of *radiography* continues to engage much attention. From their observations by this method, Strauss and Brandenstein[1] divide cases of chronic constipation into: (1) Colonic; (2) Cæcal; (3) Sigmoidal; (4) Rectal; according as the delay occurs in these respective parts of the large bowel. They admit that careful examination of the abdomen and rectum by ordinary methods of palpation enables these types to be distinguished without recourse to the *x*-rays. They do not consider that ptosis of the colon is an important factor in the production of constipation.

Schwarz[2] divides cases according to the supposed disturbance of function in the colon rather than according to the situation of the delay. He believes that one can distinguish by this means: (1) A "hypokinetic" group characterized radiographically by absence of the physiological division of the fæcal "column," delayed entry of the latter into the pelvic colon, and defective formation of the "pelvic globe," with fragmentary evacuations; (2) A "dyskinetic" group, in which the filling of the pelvic colon and the formation of the "pelvic globe" take place in the normal time, but in which an abnormal exaggeration of the dividing function (hypersegmentation) or of retroperistalsis takes place.

TREATMENT.—Newburgh[3] and Gallant[4] both recommend a **Diet Rich in Cellulose** as a preventive of constipation. The former suggests the following menu, which, of course, is adapted to American habits:—

Breakfast.—Fruit, apple, grapes, or berries. Cereal: large helping of oatmeal, cracked wheat or corn meal. Eggs, in any form, Graham or whole-wheat bread, toasted or not, coffee or tea.

Luncheon.—Small helping of fish or meat, with a large helping of spinach, cauliflower, cabbage, tomatoes, green peas, or beans. Two or more slices of whole-wheat or Graham bread, or oatmeal crackers. Dessert as desired.

Dinner.—Unstrained vegetable soup. Small helping of meat, fish, or poultry, baked potato, "jacket" and all; peas, beans, spinach, or cauliflower; salad, made from lettuce, celery, or asparagus; bread as at luncheon; dessert as desired; coffee.

Gallant goes so far as to advise the use of coarse, unground, raw **Bran,** in quantities of from one to four heaped tablespoonfuls daily. It may be taken either stirred up in water or mixed with some cooked cereal. On the other hand, Strauss and Frankenstein, in the paper already referred to, warn against the danger of exciting a local catarrh of the bowel by the use of a coarse diet in those cases in which stagnation takes place in certain local areas, e.g., the cæcum.

In recent volumes of the ANNUAL, references have been given to the use of **Hormonal** in constipation. Sachur[5] has lately reported on the effects of an improved form of the preparation. He gave it intravenously, and did not find that it produced any bad effects if injected slowly. It is specially indicated in cases of paralytic ileus and in post-operative intestinal paralysis and simple atonic constipation. In spastic constipation it is useless.

REFERENCES.—[1]*Berl. klin. Woch.* 1913, 1000; [2]*Münch. med. Woch.* 1913, 2151; [3]*Bost. Med. and Surg. Jour.* 1913, i, 777; [4]*N.Y. Med. Jour.* 1912, ii, 414; [5]*Deut. med. Woch.* 1913, 401.

CORNEA, DISEASES OF.

A. Hugh Thompson, M.D.

On the whole, the treatment of interstitial keratitis does not seem to have been much helped by the discovery of **Salvarsan** and **Neosalvarsan** (MEDICAL ANNUAL, 1913, 214). It is true that improvement has often followed injections of these drugs, but evidence is lacking that it has been more rapid than it would have been without. In Germany, the local instillation of neo-salvarsan drops into the conjunctival sac has been tried after some experiments on rabbits, but in the case of humans the results have not been encouraging. Neither Bachstez[1] working in Prof. Dimmer's clinic in Vienna, nor Hoehl,[2] in Hess's clinic in Munich, can report any successes by this method.

On the other hand, G. F. C. Wallis[3] speaks much more favourably of his experience of these drugs while he was house surgeon at Moorfields Hospital. It is only, as a rule, after the administration of the third or fourth dose, he says, that the cornea begins to clear, the pupils to dilate, and the ciliary injection and photophobia to subside. The drugs were administered by intravenous injection at intervals of ten to fourteen days. Neosalvarsan seems to be quite as efficacious as, and to cause no more local reaction than, salvarsan. The patients treated at Moorfields had mercury and iodides in addition, and it must be remembered that their recovery was probably aided greatly by several weeks' residence in hospital, with its attendant hygienic conditions. [This last consideration goes far to discount the specific effect of the drug.—A. H. T.]

REFERENCES.—[1]*Wien. klin. Woch.* 1913, 803; [2]*Münch. med. Woch.* 1913, 17; [3]*Ophthalmoscope*, 1913, 133.

COUGH.

J. J. Perkins, M.B., F.R.C.P.

Cough, as Mayo Collier[1] says, is a symptom so universally associated with affections of the lungs, bronchi, or larynx that it seldom occurs to one to look for its cause outside the respiratory tract. The three cases that he reports are interesting and instructive in that the cough, which in each was very severe, was not connected with any of the usual localities. The first case was that of a lady who had been under treatment without benefit for cough of the severest type, sufficiently persistent to keep her awake the whole of the night; lungs, larynx, and post nasal space were all healthy, the only sign of disease being a purulent discharge from the left ear. The canal was syringed, and a large polypus found hanging from the edge of an opening into the tympanum. The syringing set up an uncontrollable spasm of coughing, so severe that nothing could be done until cocaine had been applied. The polypus was removed, and the cough stopped in forty-eight hours. The second case was that of a lady who suffered from persistent cough, supposed to be due to gout; as there was pain shooting to the ear and under the root of the tongue, the patient was convinced that cancer was developing. In this case, as in the previous one, the larynx, nose, post-nasal space, and mouth were all healthy; but in the ear on the painful side there was a large mass of impacted wax, with the removal of which all the symptoms ceased. The third case was that of a woman who suffered from continual cough day and night, brought up quantities of blood, was extremely emaciated, and thought, therefore, to be in the last stages of consumption or cancer of the lung. From the postnasal space a large polypus was speedily removed, after which the bleeding and cough stopped and the patient regained excellent health. *Moral*: in cases of obscure cough, always examine the throat, nose, and ear, as well as the lungs.

REFERENCE.—[1]*Med. Press and Circ.* 1913, ii, 634.

DEMENTIA PARALYTICA. (*See* SYPHILIS, CEREBROSPINAL.)

DENGUE.

Leonard Rogers, M.D., F.R.C.P.

W. L. Harnett[1] records a number of differential leucocyte counts in dengue in Assam during the epidemic of 1912. The duration and character of the fever cases were very variable, being from two to six days, and the types from three day fever of northern India up to text-book cases of dengue, including the saddle-back type. He agrees with previous observers in finding a leucopenia well marked after the second day, with an increase of the large and small lymphocytes but not of the large mononuclears (hyalines) at the expense of the polynuclears. In addition, he calls attention to a change not hitherto described in dengue, namely, a variable amount of eosinophilia always present, and sometimes dominating the picture, which sets in about the fourth to sixth day, is well marked by the tenth day, and persists for some time afterwards. The average eosinophile percentage of the first counts in a series of 24 cases was 1·7, and of later counts 13·4; in only three cases did it fall below 5 per cent. In several cases the fæces were examined for ova of intestinal parasites with negative results. Although the eosinophilia occurs about the same time as the rash, he found no relationship between the degree of the two. This eosinophilia he thinks is characteristic of dengue, and he suggests that it may serve to decide the relationship of dengue to three-day and seven-day fevers. He has not seen a series of cases of seven-day fever, but encountered three-day fever in Dehra Dun, in the United Provinces, and records notes of counts in nine cases showing precisely the same late eosinophilia as in the Assam epidemic of dengue.

Reference.—*Ind. Med. Gaz.* 1917, 41.

DIABETES INSIPIDUS.

Francis D. Boyd, M.D.

The experimental work of Schäfer and his collaborators has shown that injections of extracts of the infundibular lobe of the pituitary body have a profound diuretic influence. The renal arteries are exempt from the general constrictive effect caused by posterior lobe extracts upon other vascular channels and upon unstriped muscle in general. The diuresis has been ascribed to a direct action upon the renal epithelium, and is independent of the hæmodynamic response to the extract, for it persists long after the secondary fall in blood pressure and recession of the kidney to its original size. Cushing[1] points out that experimental polyurias can be brought about either by direct operative interference with the hypophysis, by injection of extracts, or by glandular implantation; but hypophyseal diuresis may be elicited by stimulation of the cervical sympathetic passing from the medulla through the cord to the three upper thoracic nerves. The experimental data thus show that the infundibular lobe contains a chemical body or hormone capable of eliciting diuresis.

Diabetes insipidus, according to our best known text-books, is symptomatically defined as a long-continued disorder, characterized by polyuria and polydipsia with sugar-free urine of low specific gravity. In the author's extensive experience with patients who have received injuries involving the cranial base, polyuria with polydipsia has been observed in a number of instances. Similar conditions have been reported by others. In these basal lesions the pituitary body is often the seat of extravasation, which may readily account for the diuretic and glycosuric response occasionally exhibited by recipients of severe cranial injuries. A review of the clinical histories of the published cases of patients suffering from diabetes insipidus makes it clear that a large percentage have shown symptomatic evidence of a lesion involving the base of the brain. Gummatous meningitis affecting the structures in the middle cerebral fossa is a particularly common accompaniment of the disorder. An observation of special significance in this connection was commented on by Futcher, and has been recently emphasized again by E. Frank, viz., the surprising frequency with which primary optic atrophy, often with bitemporal hemianopsia, accompanies the encephalic polyurias often classified as diabetes insipidus. Indeed, diabetes has often been looked upon as a cause of the optic atrophy. Cushing gives the clinical history of a number of cases, and concludes that these observations, coupled with experimental data, suggest not only that emotional polyurias are in all likelihood the expression of an urogenic discharge of hypophysial secretion, but also that clinical polyurias of long duration are in many instances merely the symptomatic expression of an internal secretory disturbance brought about by injury or disease involving the hypophysial neighbourhood. Hence, our ideas of diabetes insipidus need to be recast with special reference to the factor of the secretory activity of the pituitary body, and particularly of its posterior lobe.

Benario,[2] in an article on the pathology and therapeutics of diabetes insipidus, concludes that the posterior lobe of the pituitary body is of the utmost importance in the etiology. He has collected a number of cases of disturbance of the hypophysis referable to a gummatous process in or around it. The cure of that process, and the possibility of influencing it by antisyphilitic treatment, are accountable for variability in the severity of the clinical symptoms. In tertiary syphilis, the nasopharynx is primarily affected, and the cause of the polyuria is to be found in an extension of the gummatous process from this cavity to the sella turcica and hypophysis. (*See also* PITUITARY BODY.)

REFERENCES.—[1]*Bost. Med. and Surg. Jour.* 1913, i, 901; [2]*Münch. med. Woch.* 1913, 1768.

DIABETES MELLITUS.

Francis D. Boyd, M.D.

At the International Congress of Medicine a discussion took place on diabetes mellitus.[1] The subject was introduced by Dock, who went fully into the different views that have been published in the hope of clearing up its etiology. The connection of diabetes with the pancreas was well known; perhaps too much attention was paid to the pancreas in diabetes, and too little to the other organs of the body. The control exercised by the central nervous system on the sugar-producing function of the liver was better recognized nowadays than it used to be; the fact that many spots in the brain, besides the diabetic centre of Claude Bernard, gave rise to diabetes on puncture was not sufficiently recognized. Cushing's admirable work on the pituitary gland showed that its posterior lobe played an important, if indefinite, rôle in the metabolism of the carbohydrates, and its glycolytic function appeared to be under the control of the superior cervical ganglion of the sympathetic. Acidosis, the terminal event that brought on diabetic coma in so many cases, was connected with decrease in the amount of carbohydrate in the diet, increased fat-metabolism, and increase in the formation of sugar from the proteins of the bodily tissues. In the treatment of the disease, now mainly a matter of dieting, it was important to secure the attention and intelligent help of the patient.

Von Noorden gave a succinct account of the most recent views of the way in which the carbohydrate metabolism of the body is regulated. Needless to say, this regulation was highly complicated, and it was hard to decide at what point a description of it should begin. However, starting with the intestine, it might be said that it poured the sugar—glucose—absorbed from the food into the portal vein. This glucose was seized by the liver and stored in the form of glycogen. The liver retailed this glycogen, converted once more into the form of glucose, in accordance with the demands made upon it by the tissues. Professor von Noorden presented to his audience a diagrammatic scheme in which the control of the glycogenic function of the liver was set out. The pancreas was the organ that tended to keep the consumption of sugar down; the chromaffin system (or, to mention its chief constituent, the suprarenal gland) tried to increase its consumption. But the pancreas was in turn controlled by the thyroid gland, the parathyroids, and the hypophysis; while the chromaffin system was under the control of the central nervous system. All these controls, except that of the central nervous system, were exercised by the medium of the secretions of the various glands concerned, conveyed about the body by the blood stream. The regulation of the glycogenic function of the liver by the pancreas and chromaffin system in the normal subject was such that the blood contained from 6 to 8 parts of glucose per 10,000. In diabetes this quantity was increased, either because the inhibiting power of the pancreas was weakened, speaking generally, or because the augmenting power of the chromaffin system was increased. In Claude Bernard's diabetic puncture of the brain, for example, the glycosuria was due to the central stimulation of the chromaffin system. Acidosis was fatal by removing the ammonia and alkaline bases from the body in excessive amounts; diabetic coma was the expression of alkaline poverty of the tissues.

Coming to the treatment, von Noorden said drugs were but little given to diabetics as such nowadays; the treatment consisted almost entirely in setting each patient to live on exactly the diet that suited him best. A sugar-free diet was first given to reduce the glycosuria to the lowest possible value; in favourable cases the sugar disappeared from the urine. The next step was to ascertain by direct experiment what was the limit of the patient's tolerance for carbohydrate; sugary or starchy foods were added cautiously to the dietary, and their effect in producing glycosuria was carefully watched. These tolerance tests required the constant supervision and regulation of the physician. It was most important that the body's sugar manufactories should at no time be over-burdened; the urine must be kept as free from sugar as possible, or the disease would progress. Too much must not be expected from such treatment; there always would be cases that progressed in spite of the greatest care, because the lesions on which the disease depended were sometimes inevitably progressive. In severe cases he advised the adoption of alternating periods of carbohydrate feeding and carbohydrate starvation. Most patients should have plenty of fat in their diet; in severe cases two or three ounces of whiskey should be given every day. Ten years ago von Noorden invented his well-known "**Oatmeal Cure**": first the glycosuria must be reduced by strict dieting, then about half a pound of oatmeal a day should be added to the diet for several days in succession. The oatmeal treatment was found to do good, but for what reason was not understood. Banana cures and flour cures worked on similar lines had also been employed successfully.

Rosenfeld said that many carbohydrates which were not chemically related to glucose had been tried with varying and inconstant degrees of success; glycerin, arabinose, inulin, lactose, and others were specially to be mentioned. He brought forward a new carbohydrate that seemed not to increase the sugar production of diabetics, known by the commercial name of **Hediosite**; the name by which it was known to the chemist was glycoheptonic acid. It was well absorbed; most patients could take from one to two ounces of it a day; many could take three or four ounces, but the larger doses might set up diarrhœa. It was a form of carbohydrate that could be utilized and burnt up by the tissues of even the worst cases of diabetes, and in some unexplained manner it seemed to lessen the glycosuria.

Knox[2] points out the rarity of diabetes mellitus in *early infancy*. Amongst 6,406 fatal cases of diabetes occurring in England and Wales in a decade, there were but 8 under one year. Knox's patient was an infant girl, nine months of age. When first seen she appeared well, but was receiving an unduly large amount of malt soup in her milk mixture. This was rectified, but a month afterwards the infant was brought for examination because she was not gaining weight. Sugar was found in the urine, the disease rapidly progressed, acidosis developed, and the infant died after an illness of about three weeks. A section showed the islands of Langerhans diminished in size and number. Of fifteen collected cases of diabetes under one year of age, the majority were in males; heredity seems to have played but little part as an etiological factor. In three of the fifteen, continuous over-feeding with sugar preceded the onset of the malady. Injury to, or alteration of, the central nervous system was often associated with the beginning of the illness. The common symptoms were increased thirst and hunger, loss of weight, polyuria, and glycosuria; acidosis and coma occasionally ended the scene. The prognosis is grave but not hopeless in infancy, in a severe grade of the disease. Treatment, though difficult to carry out, should follow the lines found most successful in the treatment of diabetes in adults—the carbohydrate tolerance should be determined and the sugar content of the milk mixture correspondingly reduced, the caloric requirements being furnished by fats and proteins. An "oatmeal day" or days should be given at frequent intervals.

Saundby,[3] in a lecture on the *curability of diabetes*, urges that by far the commonest cause of transitory glycosuria is alcohol, and that its prolonged abuse may lead to persistent and fatal diabetes. Alcoholic glycosuria is so common that it is amazing that at the present day there should be any doubt about it. Alcohol interferes with the glycogenic function of the liver; a single large dose will do this temporarily, and the effect soon disappears; but persistent alcoholic excess maintains this functional depression until ultimately it becomes permanent, and true diabetes is developed.

An interesting communication by Richards[4] is on the *Wassermann reaction* in diabetes with reference to its relation to acidosis. In this study, cases of simple acetonuria are not included, but only those in which oxybutyric and diacetic acids occurred in the urine. Four cases of diabetes with marked acidosis were examined. In all four a marked Wassermann reaction was present on several occasions, and the reaction was unaffected by anti-syphilitic treatment. Cases of diabetes were examined in which acidosis was not present and a negative reaction obtained. Syphilis was not an etiological factor in any of the cases studied, and the reaction is not indicative of syphilis when positive in diabetic acidosis.

Beveridge[5] lays great stress on *intestinal stasis and putrefaction* as a primary factor in the causation of pancreatic disease and diabetes. It is claimed that much benefit may be obtained by treatment by **B. bulgaricus**, whose action upon sugar results in the formation of lactic acid. The necessity for starch as a food is fully recognized; but if digestion is unable to break down its molecules it becomes harmful, as in glycosurics. By the action of the bacillus, much needed carbohydrate may be taken, with little if any excess of sugar appearing in the urine. Its chemical action is of great importance when the normal conversion of sugar in the alimentary tract is at fault, and if an active culture is given, the liver and pancreas are aided in carbohydrate digestion. The lactic acid is of practical importance in stimulating the pancreas when the gastric acidity is low. The action of the bacillus in combating intestinal putrefaction and autointoxication is marked. In the milder cases of diabetes the treatment seems to have been followed by beneficial results, the symptoms disappearing, but in others glycosuria remained, though the sugar diminished in quantity. In the severe cases, results were not so striking. Blodgett[6] records an exhaustive trial of the Bulgarian bacillus in six cases, and is unable to obtain any evidence of benefit from its administration.

Montgomery,[7] discussing the *frequency of tuberculosis in diabetics*, finds that it is not definitely higher than in the general population. One is impressed, however, by two facts—the lowered opsonic index to the tubercle bacillus and to a number of other bacteria in diabetes, and the large number of diabetics who, late in the course of the disease, develop a very acute and rapidly fatal form of consumption. Tuberculosis occurs more frequently in diabetes than in some other chronic diseases, but its frequency varies with many different circumstances. When diabetes and tuberculosis are associated, the former can easily be shown to be the primary disease. In no case in the writer's experience has tuberculosis been definitely proved to be primary. From the number of cases that have improved, one cannot consider a combination of diabetes and tuberculosis as necessarily more hopeless than either disease alone. The prognosis in many cases depends largely on treatment.

Operations on diabetics.—Miller drew attention to the fact that in diabetics the *removal of tumours* was sometimes followed by the disappearance of the glycosuria. His patient was a female who passed 50 grams of sugar daily in spite of a rigid diet. Hysterectomy was necessary for uterine hæmorrhage. Carcinoma of the uterus was discovered; the patient made an uninterrupted recovery, and several months afterwards was sugar-free in spite of an unrestricted diet. Joslin reported a similar case, where the removal of fibroid tumours was followed by the disappearance of sugar from the urine in a patient apparently suffering from a severe form of diabetes. Manges[5] reports two additional cases, both suffering from severe diabetes with advanced prostatic disease. The first, a man of sixty-two, with long-standing diabetes and prostatic troubles of several years' duration, was considered a bad surgical risk. Finally, the urinary condition became so urgent that operation could not be delayed. The operation afforded relief, the sugar greatly diminished, and acidosis, which had been present, disappeared. The second, a man of seventy, suffered also from severe prostatic difficulties, and seemed a bad surgical risk. The patient, however, made a complete recovery; the sugar disappeared from the urine, and never returned in spite of a most liberal diet. It is difficult to suggest any feasible explanation of the disappearance of the glycosuria in these cases. In none of the four was there present a chronic interstitial nephritis with increased blood-pressure, a condition sometimes associated with improvement or cure of diabetes; in the four cases in which operation was required the tumour was situated in the genital tract. Of more importance than etiological speculations are the practical conclusions regarding prognosis in operation in severe diabetes. The sufferers have always been a dread "touch-me-not" for the surgeon, with the result that many have been allowed to die unrelieved. These cases show that the prognosis, from an operative point of view, is far better than is generally believed. We may even go further, and hope that benefit to the diabetes may follow operation. In general, it may be said that the practitioner and surgeon have too great a fear of acidosis. When the β-oxybutyric acid tests are negative there is no danger, no matter how intense the acetone reaction may be. If the proportion of ammonium nitrogen to total nitrogen is low, the danger from grave acidosis or coma after operation is not great enough to contraindicate necessary surgical interference. (*See also* GANGRENE, SURGERY OF).

REFERENCES.—[1]*Lancet* 1913, ii, 548; [2]*Johns Hop. Hosp. Bull.* 1913, 274; [3]*Med. Press and Circ.* 1913, i, 680; [4]*Jour. Amer. Med. Assoc.* 1913, i, 1139; [5]*N.Y. Med. Jour.* 1913, ii, 70; [6]*Med. Rec.* 1913, i, 1071; [7]*Amer. Jour. Med. Sci.* 1912, ii, 543; [8]*Jour. Amer. Med. Assoc.* 1913, i, 661.

DIARRHŒA OF GASTRIC ORIGIN. *Robert Hutchison, M.D., F.R.C.P.*

This variety of chronic diarrhœa—also known as "gastrogenic diarrhœa"—is by no means uncommon, but is still not as well known to practitioners as it ought to be. It results from a defective secretion of gastric juice. The following account of its clinical features from a paper by Van der Hoof[1] gives a clear description of it. The most striking feature of the diarrhœa is its occurrence early in the morning and during the forenoon. As a rule, it may be said that patients with this condition are unlikely to have any bowel movements in the afternoon or at night. It often awakens the individual from sleep at five or six o'clock in the morning, a second call to stool generally occurs before breakfast, and one to three movements take place between breakfast and the midday meal. In other patients the diarrhœa is more profuse, with very frequent stools. In some cases the diarrhœa may alternate with constipation, but often the constipation may be attributed to full doses of astringent drugs, with which these patients are so often treated.

The stools are liquid and inoffensive, as a rule, and show the presence of macroscopic particles of undigested food, especially fruit and vegetables. In other cases they are soft and yellow, and shew an excess of fatty acid crystals. Mucus and blood are not usually seen, but may occur during exacerbations. Flatulence and peristaltic unrest are the rule, especially in the early morning hours. With these there may be griping pains throughout the abdomen, although most patients are free from actual abdominal pain. Irritability of the bladder, relieved after defæcation, is not uncommon.

Gastric symptoms are often lacking, or are overshadowed by the condition of the bowels. The entire absence of any complaint referred to the stomach is rather striking. The appetite is generally unimpaired, although the patient may be afraid to eat. Occasionally there is slight nausea, and, curiously enough, the patient may recite the symptoms of hyperchlorhydria. Loss of weight and strength may develop quickly after the intestinal disturbance sets in. In other cases, with distinct weakness and prostration, there may be no diminution of the body weight. Early in the disease, and in the absence of complications, the patient does not look ill. Other individuals may show a marked secondary anæmia, but quite distinguishable from the blood picture of pernicious anæmia. Indicanuria is pronounced in most cases. Muscular pains and slight recurring arthritis are not uncommon, or there may be a definite neuritis.

The *test breakfast* makes a relatively short stay in the stomach, which empties itself so quickly that often no remains can be obtained after the lapse of one hour. It is advisable to pass the stomach tube in forty or forty-five minutes after the breakfast has been taken. The material obtained shows a characteristic gross appearance. The bread particles are coarsely divided and show no evidence of having been acted upon by any digestive agent, and the fluid portion is clear, thin, and colourless, without visible blood or mucus. The tests for the presence of free HCl are negative, and the total acidity is usually below 10 "acidity per cent."

TREATMENT.—The chief dietetic indication is the **Restriction of Proteins.** The author has found **Buttermilk** up to three pints daily well borne, and useful where nutrition is impaired. Medicinal treatment consists in the *free* administration of **Hydrochloric Acid** (30 drops of the official acid in a full glass of water half an hour after each meal, the dose to be repeated in another half hour).

REFERENCE.—[1] *Amer. Jour. Med. Sci.* 1912, ii, 170.

DIARRHŒA, INFANTILE.

Frederick Langmead, M.D., F.R.C.P.

Among the measures commonly employed for the epidemic diarrhœa of the summer months, **Subcutaneous Saline Injections** have in the last few years taken a prominent place. It is important, therefore, that their value should be carefully investigated. H. B. Day[1] records the results of an investigation conducted by the Public Health Department of Egypt in the poorest quarters of Cairo. Only severe cases were selected, and 444 are available for statistical purposes. It was found impossible to classify them into any etiological or clinical groups.

The following solutions were used :—

1. Quinton's marine plasma. This consists of sea-water, collected in sterilized vessels at a sufficient depth and distance from land to ensure purity, and diluted with sterilized tap-water to make an isotonic solution. On analysis it yields 1 per cent of total chlorides

2. Sea water collected off Alexandria, diluted in the same way. This was put up in sterilized bottles, and the whole heated in an autoclave to ensure sterility. [A step which might injure the utility of the plasma. It might have been simply passed through a Pasteur filter.—ED. *Med. Ann.*].

3. Ringer's solution.

All the solutions are decidedly hypertonic as compared with the ·6 or ·75 saline commonly used. During the cooler months, the saline was warmed by running it through a glass coil immersed in a tin of hot water, so that it issued from the needle at approximately body temperature. The skin at the site of injection was sterilized with tincture of iodine only. The dose varied from 25 to 150 c.c., according to the rapidity of its absorption. Improvement was generally manifest after the first day, but unless the injections were continued, a relapse usually occurred.

Analysis of all the cases treated showed that diarrhœa in the first few months of life is particularly fatal. Cases with a subnormal temperature, indicative of collapse, are attended with the highest mortality ; otherwise the gravity of the illness is proportional to the degree of fever, although babies with a high febrile reaction to the saline (104° F.) generally did well. The previous condition of the patient, and the duration of the illness before treatment, were factors of considerable importance affecting more the duration of treatment necessary than the immediate mortality. Two series of cases were treated concurrently, one by injections only, the other by drugs alone, and the results showed the superiority of the ordinary methods of treatment by drugs. When vomiting was at all a prominent symptom, **Dilute Iodine Solution** (Tinct. Iodi ♏iij, Aq. ℥j) was prescribed, a small teaspoonful every two hours, before each feed. This was very successful in checking the vomiting. The most useful medicine was found to be **Calomel** combined with **Bismuth** (Calomel gr. ⅙, Bismuth. Carb. gr. iss), which gave better results than grey powder. When the presence of mucus and blood in the stools indicated that the large intestine was involved, **Salines** (sodium sulphate or phosphate) were prescribed with benefit. The addition of a little **Tincture of Opium** was valuable in severe cases.

The conclusions arrived at as the result of the investigation were (1) That saline injections alone, without drugs, are capable of curing most cases of infantile diarrhœa; (2) Quinton's marine plasma has no definite superiority over artificial saline of the same strength. Such hypertonic solutions are preferable to those which are weaker (·75 per cent or less); (3) The administration of medicine is preferable to injections of saline as a routine treatment; (4) Disregard of dietary instructions is the commonest cause of failure in out-patient treatment; and (5) Injections are valuable in proportion as the loss of fluid—by vomiting and diarrhœa—exceeds the intake. They should be given before actual symptoms of collapse arise.

Intraperitoneal Injections of Saline are preferred by some. According to C. Miller,[2] it has many advantages: it causes very little inconvenience, large quantities of fluid may be given in a short time, and it is rapidly absorbed. To the objection which has been raised, that there is risk of wounding the intestine, he replies that he has never seen this happen. He inserts the needle through the abdominal wall just below the umbilicus. The good results in his experience are very striking.

The majority of pediatrists consider complete abandonment of milk to be the most essential point in treatment. Clock,[3] however, strongly combats this practice, stating that a starvation diet accompanied by purgation is productive of loss of weight and strength, and serves to prolong its course. He considers that the results which he has obtained in 117 cases by implantation of the **Bacillus Lactis Bulgaricus** corroborate his views: 116 recovered and 1 died; 72 returned to the dispensary during the winter for some other affection, and 41 of the remainder were able to be traced and found to be in good health. The babies' ages varied from six weeks to two and a half years, and the average time from the onset of the disease until the treatment was started was one week. It consisted in the administration of a pure culture of the true Bulgarian bacillus first described by Grigoroff. It was prescribed in tablet form, 1 or 2 tablets being given every two or three hours in most cases, but 2 or 3 every two or three hours before and after each feeding in severe cases. Seventy-four infants were continued on their respective milk diets and 43 were placed on barley water for twenty-four or forty-eight hours, after which small quantities of boiled, skimmed, or whole milk were usually added to the diet. Twenty-nine of the 43 were given a preliminary dose of castor oil, but no cathartic was used for those kept on milk. Improvement by this method of treatment was shown by gain in weight, rapid change in the character of the stools to normal colour and consistency, improved appetite, subsidence of fever, abatement of vomiting, and a healthier appearance. The babies who were allowed milk showed an average gain in weight, during the first twenty-four hours, of only half an ounce less than the average gain in the entire first week by those for whom milk was interdicted. In his opinion, it is the lack of a pure, active culture of the bacillus in viable form which has been the cause of the indifferent results obtained in previous years with lactic-acid bacterial therapy.

REFERENCES.—[1]*Pract.* 1913, ii, 58; [2]*Lancet*, 1913, ii, 774; [3]*Jour. Amer. Med. Assoc.* 1913, ii, 164.

DIPHTHERIA.

E. W. Goodall, M.D.

PATHOLOGY.—An account of three cases of *diphtheria of the œsophagus* has been published by J. D. Rolleston,[1] and one of *diphtheria of the stomach* by F. E. Tylecote.[2] Both these conditions are rare. In the former the lower third of the œsophagus was involved, in the latter nearly the whole of the stomach. Perhaps if a more systematic inspection of the organs was made in autopsies, it would be found that their involvement by diphtheritic membrane was not so rare as it appears to be. Rolleston, indeed, quotes Mallory as stating that the œsophagus was involved in 12 out of 251 autopsies (4·7 per cent), and Tylecote refers to Councilman, Mallory, and Pearce's experience at Boston; these observers found the stomach involved in 5 out of 220 fatal cases. But even when the stomach is invaded, it is rarely so completely as in Tylecote's case. Unfortunately the condition cannot be diagnosed during life, unless the patient vomits a cast of the organ. Both papers contain full references to previously recorded cases.

TREATMENT.—Although it is nearly nineteen years since the **Antitoxin** treatment of diphtheria was introduced, there is still considerable diversity of opinion on the question of dosage, even amongst those who have had a large experience. W. H. Park[3] quotes various authorities as recommending doses up to maxima which differ so widely as 6,000 and 400,000 units. He refers in some detail to clinical observations which lead him to state that "amounts of antitoxin beyond 25,000 units in a child, and 50,000 in an adult, are absolutely unnecessary and useless; and that an initial dose of 10,000 in a child and 20,000 in an adult is probably sufficient for the whole course of the disease." He is of the opinion that it is important to give all the required antitoxin promptly, and usually in a single dose, because experiments on animals and observations on human beings go to show that antitoxin given by subcutaneous injection is absorbed very slowly. "In some patients antitoxin formation goes on rapidly, excited by the toxin produced in the diseased tissues, to add its amount to that given. In the chart of such a child we notice at first the usual slow absorption which by the end of a day is but half a unit [per c.c. of blood]; suddenly the antitoxin formation begins, and the child has, by the end of the fifth day, 60 units in each c.c. of blood, and at least 90 per cent of this is due to its own production. This was the only child tested who made such a tremendous amount of antitoxin; most children produce comparatively little. The important fact is that what we give subcutaneously on the first day is rendering the body fluid more and more antitoxic until the third or fourth day."

The author thinks that weight and size are of importance in influencing the magnitude of the dose. "If we give two children, one of 40 lb. and one of 80 lb., a certain amount of antitoxin, the larger child will have approximately one half as much antitoxin in each c.c. circulating in the blood as has the child of half the size. I think there can be no question that it is chiefly the concentration in the blood and not the total amount which measures the effect." By the intravenous method of administering antitoxin the whole amount is launched into the blood at once. This method, therefore, should be resorted to in severe cases. Intramuscular injections are absorbed in about half the time required by subcutaneous injection; but the serum often escapes from the muscle into the surrounding tissues.

In the last volume of the ANNUAL an account was given of Schiötz's method of treating diphtheria carriers by **Spraying** or **Swabbing** the fauces with **Bouillon Cultures of Staphylococcus Pyogenes Aureus.** Additional reports of cases treated in this way are now to hand. J. D. Rolleston[1] reports 10 cases; F. L. Wright,[2] several (exact number not stated); and A. M. Alden,[3] 16. The latter states that 15 cases were cleared in a few days of diphtheria bacilli after other methods had been unsuccessfully employed, but that in one case the method absolutely failed. Wright's experience was obtained in the New York State Agricultural and Industrial School, in which there were about 740 boys of ages ranging from six to seventeen years. The school was much troubled with carriers, mainly introduced from outside. Wright states that in his hands the method was innocuous and capable of causing early disappearance of the bacilli. Rolleston's patients were convalescing from diphtheria. In six faucial cases the diphtheria bacilli disappeared in two to seven days; in two nasal cases the treatment was ineffective. Apparently, in the remaining two cases the bacilli disappeared only after a considerable period. In eight of the cases a mild form of sore throat was produced; and either this effect or slight nasal catarrh was set up in six of Alden's cases. Clara M. Davis[4] reports a case in which well-marked follicular tonsillitis occurred apparently as the result of the treatment. Rolleston writes that "as the process entails some degree of discomfort, it is well not to employ it until other methods have been tried," and for that reason he applied it only to chronic carriers in whom the bacilli had been present for more than six weeks. He also gives reasons for not using it except at a late stage of convalescence. (1) In the early stage the mucous membrane has not recovered from the effects of the attack of diphtheria; there is still a breach of the surface which would render the deeper tissues liable to invasion by pyogenic organisms. (2) The excess of mucus and detritus present during the acute stage shelters the diphtheria bacilli from the action of the staphylococci. (3) Since most of the patients must be detained in hospitals owing to the possibility of complications, it is unnecessary to resort to the treatment early. Rolleston quotes certain experiments of Lydia de Witt,[9] which suggest that the apparently favourable action of the staphylococci is due "not to an incompatibility between the two organisms, but to a reinforcement of the normal throat flora."

Harold B. Wood[8] reports four cases in which it seemed that a **Spray** of the **Bacillus Acidi Lactici** was efficacious in ridding the fauces of diphtheria bacilli.

R. Tanner Hewlett[10] has published another case of the apparently successful treatment of a carrier by his method of the subcutaneous injection of **Diphtheria Endotoxin.**

[These results are referred to here because it is the commonly held opinion that most diphtheria carriers are highly dangerous to the community. This is not my view. Though occasionally a carrier appears to, and most likely does, do harm, by spreading the disease, yet the danger attributed to them is much over-estimated. Again, whether the treatment by the *Staphylococcus pyogenes aureus* really performs all that is claimed for it, still remains to be proved. In most cases of diphtheria the bacilli disappear naturally after a few weeks, without any treatment.—E. W. G.]

PROPHYLAXIS.—The production of active immunity against diphtheria by injection of a neutral or nearly neutral toxin antitoxin mixture has long been practised. Hitherto it has been believed that if a guinea-pig, the animal which is most commonly employed in experiments of this nature, could resist any particular mixture, so also could any other animal. But von Behring[11] has recently shown that this is not the case; but that a mixture which is non toxic for guinea-pigs may produce well marked reactions, with formation of antitoxin, in other animals (donkeys and monkeys), and also in the human subject. He has further found that persons who, having suffered from diphtheria, already have antitoxin in their blood, are especially susceptible to the action of the mixed toxin and antitoxin, and that in them the injection of the mixture quickly produces additional large amounts of antitoxin. His new prophylactic against diphtheria ("diphtherieschutzmittel") he describes as being a mixture of very powerful diphtheria toxin and antitoxin in such proportions that experiments on guinea-pigs show that it contains only a trifling or very small excess of toxin. In the discussion on immunization against diphtheria which took place at Wiesbaden last April, Matthes, of Marburg, reported a case in which the subcutaneous injection of $\frac{1}{10}$ c.c. of Behring's mixture gave rise to an antitoxin production of more than 600,000 units, whereas 250 units would have been quite sufficient to secure immunity. The serum from this case was used to immunize passively another patient, a child. It was stated that the passive immunity thus induced was of much longer duration than that brought about by ordinary antitoxic serum, which is obtained from horses. As in this case the injection consisted of an anthropogenous serum, the risk of the excitation of anaphylactic symptoms by any subsequent injection of serum is absent. The observations of Schreiber[12] and Zangemeister[13] (who immunized certain gravid women and new-born infants in the women's hospital at Marburg) go to show that Behring's new prophylactic is both efficacious and harmless.

REFERENCES.—[1]*Brit. Jour. Child. Dis.* 1914, 12 and 1913, 405; [2]*Ibid.* 1913, 214; [3]*Boston Med. and Surg. Jour.* 1914, i, 73; [4]*Brit. Jour. Child. Dis.* 1913, 241; [5]*Jour. Amer. Med. Assoc.* 1914, i, 26; [6]*Ibid.* i, 1879; [7]*Ibid.* ii, 103; [8]*Jour. Infect. Dis.* 1914, 25; [9]*Jour. Amer. Med. Assoc.* 1914, ii, 592; [10]*Lancet*, 1914, i, 1802; [11]*Deut. med. Woch.* 1914, 803; [12]*Ibid.* 938; [13]*Ibid.* 977.

DIVERTICULITIS.

Robert Hutchison, M.D., F.R.C.P.

DIAGNOSIS.—From a study of twenty-seven cases operated upon at the Mayo clinic, Giffin[1] draws the following conclusions. Given a patient with a tumour of the sigmoid, the points in the evidence which would favour a diagnosis of the chronic proliferative type of diverticulitis are as follows:—(1) The absence of shadows of malignancy in the general picture; (2) A tendency to obesity and the maintenance of good nutrition; (3) A *long* history of attacks of low abdominal pain localizing in the left lower quadrant; (4) A history of the previous formation of a mass and its subsequent disappearance; (5) A failure to obtain a more or less continuous history of the frequent passage of macroscopic blood in the stools; (6) The demonstration of vesical fistulæ which, on cystoscopic examination, appear to be inflammatory; and (7) The failure to demonstrate malignancy positively by sigmoidoscopic examination.

In carcinoma of the lower bowel there is usually an early loss of flesh. Pain is not a prominent feature until obstruction advances, and the mass is often found before pain has been complained of at all. Tenderness to pressure is a late finding. The relative frequency must also be kept in mind. Carcinoma of the sigmoid is about seven times as frequent as diverticulitis.

The other inflammatory forms of perisigmoiditis cannot be positively differentiated. A diagnosis of appendicitis in cases of transposition of the viscera should not be difficult. If non-rotation of the colon exist, a radiographic or fluoroscopic examination after a bismuth meal would be necessary. It must not be forgotten that a pelvic tumour may be sigmoidal, and the possibility of diverticulitis is to be considered. Pelvic inflammatory disease may be closely simulated. In fact, diverticulitis should be carefully considered in the diagnosis of all tumours of the left lower abdominal quadrant and of the pelvis.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1914, ii, 865.

DUCTUS ARTERIOSUS, PERSISTENT.

Carey Coombs, M.D., M.R.C.P.

Three papers—by Miller and Orton,[1] Wessler and Bass,[2] and [illegible][3]—describe examples of this condition. It is fairly common as congenital defects go, occurring in about one-quarter of all cases of cardiac malformation, though as an isolated fault it is much rarer.

Unless accompanied by other defects, patency of the ductus Botalli produces no symptoms. In none of Motzfeldt's three cases was there any clinical evidence of a cardiac anomaly, and it was only discovered at autopsy. In only one of five cases reported by Wessler and Bass were subjective symptoms complained of, while in that published by Miller and Orton they were not prominent. The physical signs are a strip of dullness along the upper part of the left parasternal region, loud systolic murmur maximal at the second left interspace and prolonged into diastole in adults, and a characteristic alteration of the cardiac *x*-ray shadow, which is continued upwards along the left sternal border as high as the sternoclavicular joint (*Fig.* 17). Miller and Orton, and Wessler and Bass, lay great stress on this latter phenomenon, which is probably due to dilatation of the pulmonary artery. The pulmonic second sound is sometimes very loud, and a thrill may be felt in the neck. It is important to recognize the nature of the defect when its signs are encountered, lest an unduly alarming pronouncement of serious cardiac disease be erroneously made.

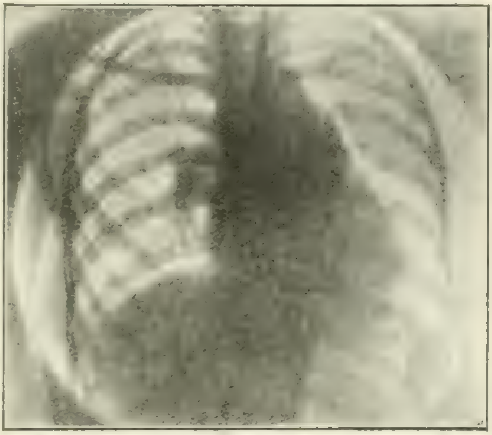


Fig. 17.—[illegible]

REFERENCES.—[1]*Brit. Jour. Child. Dis.* 1913, 100; [2]*Amer. Jour. Med. Sci.* 1913, i, 543; [3]*Deut. med. Woch.* 1913, 2033.

DYSENTERY. (*See* AMŒBIASIS.)

DYSENTERY, FLAGELLATE. *Leonard Rogers, M.D., F.R.C.P.*

Melli-Leitao[1] discusses the vexed question as to whether flagellates can produce dysenteric symptoms. Contrary to the opinions of most authorities, he maintains that they can do so in children, the incriminated varieties being the *Trichomonas intestinalis* of Leuckart and *Lamblia intestinalis*. He reports seventeen cases of diarrhœa with mucus and even a little blood in the stools, but without griping or straining, and containing very numerous flagellates, which become encysted as the stools improve. The disease is acute, but easily cured by 7 per cent **Magnesium Sulphate** and water or milk diet. Sometimes enemata of 1 per cent **Collargol** or **Electrargol** are required.

REFERENCE.—[1]*Brit. Jour. Child. Dis.* 1913, 60.

DYSPEPSIA (INTESTINAL) OF CHILDREN.

Frederick Langmead, M.D., F.R.C.P.

Cautley[1] recognizes the following forms:—

(1) Simple intestinal dyspepsia and sub-varieties: (*a*) Food fever; (*b*) Mucous disease.

(2) Catarrh of the small or large intestine, or of both: (*a*) Mucous disease; (*b*) Chronic enteritis or ileo-colitis; (*c*) Catarrhal or mucous colitis.

(3) Hepatic inadequacy or dyspepsia: (*a*) Hyposecretion of bile; (*b*) Overloading of the liver with fat or glycogen.

(4) Pancreatic inadequacy.

These various affections cannot strictly be demarcated one from the other; two or more may be present together in the same patient, and one may develop into another.

Acute intestinal dyspepsia begins suddenly, with fever. It is characterized by severe colicky pains about the navel, frequently by tympanites, and is followed by diarrhœa in a few hours. It is often called "belly ache," and is quickly cured by castor oil or an enema. It is apt to be regarded as appendicitis, but is more common in infants than in older children, and is liable to occur in diseases of the lung or pleura.

Chronic intestinal dyspepsia of the simple type may follow an acute attack, or come on insidiously, with loss of appetite and flesh, languor, debility, restlessness, and irritability. The child is disinclined to get up in the morning, and seems lifeless during the day. In the early part of the night there may be restlessness, teeth-grinding, somniloquence, pavor, somnambulism, and night-sweats, followed by deep sleep. Frontal headache is often present in the morning and after school. The children are nervous and excitable; and some are liable to violent and prolonged outbreaks of temper. Curious attacks of pallor are a common and characteristic feature, and the child experiences a feeling of faintness, but actual syncope is rare. At the same time the hands and feet are cold, and there may be colic. Such attacks are probably due to enterospasm or intestinal distension, and must be distinguished from actual fainting attacks and from *petit mal*.

The child is pale or sallow, with perhaps a slight icteric tinge or actual jaundice, and has dark rings under the eyes. There is obvious malnutrition, accompanied by soft flabby muscles, although the face is not wasted. The chest looks flattened by contrast with the pot-bellied abdomen. The skin is harsh and dry in severe cases, and the extremities are generally cold. The tongue is often pale, flabby, and indented, with a yellowish-white fur on the dorsum far back, whilst anteriorly it is covered with mucoid secretion. The appetite may be poor, lost, ravenous, or perverted. The breath may be fœtid. Vomiting, if present, is due to an exacerbation which is often described as a "bilious attack," or "an attack of gastric fever." The stools are generally normal in appearance, but may be grey and very offensive, or large, offensive, and composed of scybala. There may be frequency or looseness. Mucus is commonly present. The urine contains an excess of urates, and there may be cyclic albuminuria. Fever is absent, except during exacerbations.

The condition is most common in children during early school life and the second dentition. Boys are more liable to it than girls. Exciting factors include defective teeth, and unsuitable diet, hurried meals, insufficient rest, late meals and late hours, and too stimulating amusements. Overstrain, mental and physical, and over-anxiety, are also concomitant causes. The main cause is probably an error in diet, more especially an excess of milk and starchy foods, for regulation of diet in this respect quickly cures many cases. Large tonsils and adenoids are often present, and chronic pharyngitis almost constantly; but these abnormalities should be regarded as contributory causes, rather than as effects.

Carbohydrate or *food fever* Cautley does not regard as an entity. It is a name given to acute febrile attacks, with anorexia, headache, and general malaise. The attacks yield readily to a mercurial purge, and have in some cases been cured by strict limitation of carbohydrate foods.

Mucous disease he regards as a form of intestinal dyspepsia, in which there is a hypersecretion of mucus from the mucous membranes of the alimentary tract, the nasopharynx, the respiratory, and, occasionally, the urinary tract.

In *hepatic inadequacy* there are white or clay-coloured stools, complete acholia without jaundice, and occasionally, cystinuria. The excretion of uric acid is decreased, and that of indican increased. Sometimes the liver is swollen, and jaundice may occur. It may be the first stage of "recurrent vomiting." Cautley considers that the "acholia" described by Cheadle, and the "cœliac disease" of Gee are the same disease. It is common under two, and rare over four years of age: the stools resemble those of obstructive jaundice: they are acid, or slightly alkaline; glistening and greasy, often frothy, very offensive, and larger than normal. The other symptoms are those of intestinal dyspepsia.

Pancreatic inadequacy is characterized by large stools, colourless, and acid from excess of unsaponified fat, chiefly as fatty acids, and containing abundant stercobilin. The main symptoms are anæmia, emaciation, abdominal distention, and a liability to sore tongue, aphthæ, and ulcers. Prolonged cases lead to infantilism. Milk diet is useless, and the child must be fed on nitrogenous and dextrinized foods.

In *achylia gastrica* the chief signs are good appetite, malnutrition, abdominal pain, and diarrhœa. The stools are liquid, pultaceous, fœtid, and clay-coloured. They contain meat fibres and trypsin, no starch, and little fat, fatty acid, or connective tissue.

DIAGNOSIS.—Microscopical examination of the stools is of very great value, and the odour, colour, reaction, consistency, and presence or absence of mucus afford considerable assistance. If the stools are apparently normal, the child may be treated for simple intestinal dyspepsia. If they are white one should ascertain whether the absence of colour is due to excess of milk curd, complete absence of bile, conversion of bile into urobilinogen, or excess of fat. Worms and the simpler causes of colic must be excluded.

TREATMENT.—*General.*—In severe cases, with marked neurotic symptoms, a few days in bed is a useful preliminary. Prevent over-strain, physical or mental, and forbid working for examinations. Change of air and surroundings cures many cases quickly. Keep the abdomen and extremities warm and dry. Attend to the teeth, and remove enlarged tonsils and adenoids if present.

The *diet* should consist of simple, regular, mixed meals. Reduce milk, if it is in excess, and dilute it. Limit the amount of fermentable foods, sweets, jams, and carbohydrates generally. It is rarely necessary or advisable to omit them entirely. Malted and dextrinized foods, and honey, are the most suitable carbohydrates. At first the diet should be limited to eggs, fish, meat, bacon, butter and dripping, dry toast, rusks and malted foods. Greens, passed through a sieve, and ripe fruit, may be added later. New bread, new potatoes, fried fish, hot greasy foods, pickles, tubers, and stringy vegetables must be avoided. Cream suits a few children, and is best given with stewed fruit, but Cautley has found butter, margarine, bacon fat, and beef dripping the best forms of hydrocarbons.

Medicinal.—Cod-liver oil and hypophosphites are contra-indicated. If there is constipation, especially if there is also mucus in the stools, give **Grey Powder**, or **Rhubarb and Soda** at night, and a dose of **Sodium Sulphate** or **Apenta Water** in the morning. He recommends a mixture of **Alkali**, **Nux Vomica**, and a **Vegetable Butter** to be taken three times a day before meals. **Maltine** and **Mild Alcoholic Drinks** he considers useful. Other appropriate remedies are **Bismuth** and **Carbonate of Magnesia** for diarrhœa; **Charcoal** and **Salol** for tympanites and excess of mucus; **Decoction of Aloes** (½ to 1 dr.) before food for capricious appetite; **Calomel** for white stools; and small doses of **Dover's Powder** or **Tincture of Opium** for lientery.

More reliance should be placed on dietetic measures than on drugs, and attention should be paid to general hygiene, sleep, exercise, and amusements.

REFERENCE.—[1]*Med. Press and Circ.* 1913, ii, 711.

EAR, DISEASES OF. (*See also* EAR, SYPHILIS OF; LABYRINTHITIS; OTITIS MEDIA; OTOSCLEROSIS; TINNITUS; *and* VERTIGO.)

Geo. L. Richards, M.D.

Page[1] reports a case of *congenital bilateral microtia* with total osseous atresia of both external auditory canals, in which improvement was attained by an operation opening up the auditory canals.

Citelli[2] divides the common *polypi of the ear* into two classes, granulomatous and neoplastic. The first are of a reddish colour and granular surface, consist entirely of granulation tissue, and indicate a diffuse and severe lesion on the walls of the auditory canal. The neoplastic polypi are of a greyish transparency, with the structure of true fibromata, fibro-angiomata, and myxomata, have a favourable prognosis, and are much less common than the first. Both classes of polypi are always secondary to a latent or manifest inflammation of the walls from which they originate, and can be transformed from one into the other class. For this reason it is a question whether to consider an aural polyp an inflammatory or a neoplastic by-product.

In order rapidly to abort cases of *furunculosis*, Zografides[3] disinfects the external canal cells and pinna, and then makes from three to five cuts at the point where, with the probe, he has previously found the greatest pain; he then applies a sterile strip of gauze moistened in 10 per cent carbolic acid solution. He anæsthetizes the place with cocaine. The pain lasts from one to two hours, but has completely disappeared in five or six hours after the time of incision.

Yearsley[4] emphasizes the importance of classifying *pain in the ear* before beginning treatment. If there is neither deafness nor inflammation, it is usually due to some reflex cause, such as irritation from a carious tooth or disease of the tongue or tonsil, and usually clears up after its removal. Pain accompanied by deafness and inflammation may be caused by foreign bodies or collections of cerumen in the ear, which are easily detected upon examination. When the pain is not severe, the trouble is in the external meatus, which is red, swollen, and tender, its walls being covered with a slight amount of discharge, with fragments of macerated epithelium, while the introduction of the speculum causes moderate pain. The predominant organism is a streptococcus. Circumscribed otitis externa causes more marked symptoms, paroxysmal and severe pain, worse at night, and usually preceded by irritation and itching in the meatus. With pain in the middle ear, there is usually more or less deafness from the beginning, and the condition may be due to a simple acute inflammation of the tympanic membrane, to acute catarrhal otitis media, or to acute middle-ear suppuration. Acute middle-ear inflammation begins with sudden pain, ushering in fullness, obstruction, and tinnitus. In the early stages the deafness is slight, but increases as exudation takes place. The pain is violent, most severe at night, radiating over the side of the head, and intensified by movements of the jaw. There may be some constitutional disturbance, accompanied by fever, especially in children. When the condition does not pass beyond that of a simple catarrhal type, the symptoms are soon at their height, and remain so for twenty-four to forty-eight hours, and then quickly disappear. In more severe cases of acute tympanic catarrh, there may be perforation of the membrane, and the symptoms abate with its appearance. When the process is suppurative, the symptoms are much more severe from the onset, and are often accompanied by constitutional disturbances, fever, and rigors. Vertigo, delirium, and cerebral symptoms may appear, and in children may be mistaken for meningitis. With the appearance of perforation and purulent discharge comes relief.

Acute deep mastoiditis may be a complication of either acute or chronic middle-ear suppuration, and calls for prompt relief. The pain is of a deep, throbbing, boring character, increased by pressure or percussion.

Functional and Simulated Affections of the Auditory Apparatus.—Hovell[5] states that simulated deafness by the malingerer is found to be of sudden onset, usually noticed when he is alone or upon awakening in the morning. There is no altered modulation of the voice, and there is absence of the quick movement of the eyes found in deaf people when trying to catch the knowledge they usually derive from the sense of hearing. To detect simulated deafness, the examiner may talk of the patient's condition in a conversational voice, expressing sympathy for his condition, and while carrying on the conversation he may ask the patient to put out his tongue; the patient, taken off his guard by the seriousness of the examiner's tones, may at once do so. A test for supposed unilateral deafness is to close the normal ear with a cotton plug and to place a vibrating tuning-fork on the vertex. An impostor will assert that he does not hear the sound at all, whereas the perception must be decidedly increased in the closed ear. Perhaps he may assert that he hears it faintly on the deaf side. The deaf ear should now be closed; the sound ought to be strengthened, and the assertion that it is no longer heard will prove the imposition. Another test is by means of the watch and speech. The eyes are bandaged and the hearing distance is carefully determined. The sound ear is then apparently closed by a cotton pledget placed in the meatus. When tested with the watch and voice as before, the malingerer will say that he hears nothing in the closed ear, whereas the cotton-wool in the meatus will but slightly affect the hearing distance. (See also MALINGERING.)

REFERENCES.—[1]Mon. Otol. 1914, Dec.; [2]Ibid.; [3]Wien. klin. Woch. 1912, Dec.; [4]Clin. Jour. 1914, Apr.; [5]Jour. Laryngol. 1914, Sept.

EAR, SYPHILIS OF.

Geo. L. Richards, M.D.

Love[1] concludes, from an extensive study of syphilis and its relation to deafness in children, that the Wassermann reaction as test nearly always gives a positive result when the combination of keratitis (blindness) and deafness occurs in the child of syphilitic parents. Occasionally the result is negative. It sometimes gives a positive result in the apparently healthy brothers and sisters of those affected by blindness or deafness, thus showing that they are really infected, and that at a later date symptoms may develop. The commonest cause of death among these syphilitic children is meningitis, which occurs most commonly during the first and second years. Untreated or insufficiently treated syphilis in the parent may be discovered by the Wassermann reaction many years after infection. Healthy and diseased children may be born at any stage of the family history, but the usual family record is that the earliest children are still-born, then diseased children, and lastly, healthy children. The later children have the best chance to live. These conclusions were based on the examination of the blood of 150 persons, about half of whom were born deaf, and a third of whom have become deaf since birth. The remaining cases were not deaf at all, but were related to others in the list who are deaf.

In some families the cells which form their make up are so deficient in those determiners or factors which go to the complete development of a perfect nervous system, that the children born into them are feeble-minded, epileptic, or deaf. These defects may be accentuated by such poisons as alcohol and syphilis. Within the family stream the defect is permanent, and is developed to its utmost by the intermingling of similar cells or by the marriage of those who are related by blood. The defect may become less frequent by streams or families uniting, one of which is perfect or free from the defect; but it cannot be stamped out so long as the family goes on at all, and the practical question is whether it is so serious for the individual and for the community that the latter should take steps to protect itself.

Luders[2] thinks the external and middle ear and labyrinth are liable to syphilitic infections as well as other parts of the body. Middle-ear infections of syphilitic origin, like those of tuberculosis, do not show any specific character. The principal symptom is a more or less sudden and increasing loss of hearing, sometimes accompanied by dizziness. The author reports five cases, in four of which the ear phenomena occurred in two to six years after acquisition of infection, the fifth being a case of hereditary syphilis. Facial paralysis on the same side as the affected ear supervened in one case; in one case, fever, nausea, vomiting, dizziness, and nystagmus were present. The author believes that in all his cases the disease manifested itself in the form of a gumma of the middle ear. Treatment, consisting of **Paracentesis** when indicated, plus vigorous antisyphilitic measures, proved effective in nearly all cases. In one, **Neosalvarsan** was employed, 0·4 gram being injected six times at ten- to twelve-day intervals, with good results.

Theimer,[3] since the introduction of the **Salvarsan** treatment, has noticed that a not inconsiderable number of cases have been described in which injury to the internal ear had to be recorded. These affections are of the internal ear, of the vestibular or of the cochlear apparatus alone, or of both together, in patients who are already subjects of an aural lesion. In some of these cases the phenomena disappear in the course of time, some after repeated salvarsan injections, some after mercurial treatment. In others the lesions proved to be permanent. In affections of one or both sections of the internal ear in persons whose ears have been previously proved to be normal, if the phenomena appear a long time—weeks or months—after injection, the symptoms may disappear after a time, or they may persist. If appearing immediately or shortly after the injection, they persist for a long time, and may prove to be permanent. There is also an affection of the internal ear, attacking by preference the vestibular apparatus solely, which appears immediately or soon after the injection, and disappears as rapidly, at most within a few days, and so completely that the phenomena become absolutely normal again. The only cases of injury to the internal ear after salvarsan which can be described as manifesting the Herxheimer reaction, are those in which the phenomena appear shortly after the injection and rapidly disappear. The disturbances affect the vestibular portion of the nerve for the most part, and, as a rule, induce the clinical appearance of a complete paralysis of the vestibular apparatus.

[illegible][4] reports eight cases where ear trouble came on four to eight weeks after salvarsan, with such symptoms as a high degree of deafness, noises, dizziness, and oscillatory nystagmus, varying in degree and situation in different individuals. He thinks that syphilis is much more sensitive to salvarsan than to mercury, and that this accounts for the fact that similar symptoms were not noticed when mercury was used. In the use of salvarsan the reaction is greater, and they become more noticeable. Great care should be used in regard to the administration of salvarsan in the presence of chronic middle-ear catarrh and in otosclerosis.

REFERENCES.—[1]*[illegible] Med. Jour.* 1913, Feb.; [2]*Med. and [illegible]* 1913, Jan.; [3]*Laryngol.* 1913, May; [4]*Med. and [illegible]* 1913, Jan.

ECZEMA.

E. Graham Little, M.D., F.R.C.P.

ETIOLOGY.—Lancashire[1] classes among predisposing causes of eczema, constitutional diseases, e.g., Bright's disease and diabetes, any debilitating illness, nervous causes such as anxiety, excitement, or worry, alcoholic and alimentary excess, autointoxication from constipation, dyspepsia, and gout. "Seborrhoeic eczema" he does not regard as properly included in this group of disease.

TREATMENT.—When any of the causes detailed above are present, they must be treated *secundum artem*. In the local management of eczema, it is important to secure protection for the skin. In acute eczema with discharging surfaces, lotions or dusting powders are indicated, and **Lead** is the most widely useful drug to incorporate in them. A ½ to 1 per cent solution of **Aluminium Acetate** or a ½ per cent solution of **Silver Nitrate** is a serviceable lotion. Where there is pus infection of the surface, **Carbolic Acid** or **Cresol Saponatum** may be added to the lotion. In chronic eczema, ointments and pastes are more generally useful. A good formula is zinc oxide 1 part, starch 1 part, soft paraffin 2 parts; to this may be added **Lenigallol** (5 per cent). Careful and persistent dressing is required. In very chronic and indurated forms, **X-rays** are often very effective. Acute and widespread cases should be kept in bed. Bulkley's **Rice-Diet** (rice, bread and butter, and water) is especially useful in reducing inflammation and itching. In anæmic patients, **Iron** is often the best medicine for their eczema. When restlessness is present, sleep must be secured with **Chloral** or **Bromides**, but morphia is contraindicated. Constipation must always be relieved, and the best general means of doing this is by **Epsom Salts**. Diet must be modified to individual needs, the underfed require feeding, the more usual overfed and under exercised patient calls for a reducing of diet. Seasoned dishes, salted meats or excess of salt with food, coffee, and alcohol should all be prohibited.

Fisher[2] commends **X-ray** treatment in eczema, quoting an experience of 62 cases so treated. A tube of very low penetration, and a minimum amount of current, are needed, and the duration of the treatment varies from six minutes in acute cases to fifteen minutes in chronic, the distance being graduated so that in acute cases the tube is farther removed from the patient than in chronic.

Hichens,[3] impressed by the observation that of twenty-eight cases of eczema admitted to his children's ward in twelve years, six ended fatally, supports the view of those who contend that it is dangerous to cure eczema in children too quickly. In none of the cases recorded was a post mortem examination made, so that the exact cause of death could not be ascertained.

Jamieson[4] has some pertinent remarks on the incidence and treatment of eczema in infants. Blond and florid children are more subject to it than brunettes. Of external causes, the most important are the use of cheap soaps, hard water, and clothing which is too rough, dirty, or too hot for the season. Of internal causes, defective elimination and irregular feeding are the most frequent.

As the urine is usually scanty, **Pure Water** in abundance should be given. Constipation should be met with **Cascara, Grey Powder,** or **Phenolphthalein**; where there is much flatulence, **Lacto-bacillin** is useful. Small doses of **Sodium Bicarbonate** are often beneficial. When the mother nurses the child, her health should be enquired into, and constipation and anæmia, if present, should be treated.

Stopford Taylor[5] insists on the advantage of **Rest in Bed** for generalized cases; for localized eruption, the rest provided by masks and bandages. Crusts are removed by **Boric Starch Poultices** (boric acid 1 part, starch 7 parts). Later, a dusting powder—**Dermatol** is the writer's favourite—may be used in conjunction with poultices. As the surface gets drier, ointments and pastes may be resorted to. These should be spread on *wet* lint soaked in cold water, and wet butter-muslin is interposed between the ointment and the skin. The skin may with advantage be painted over with 2 per cent solution of **Ichthyol** in water. In the later stage of treatment, the skin may be anointed with ointment only during the day, and dressings applied at night. Soaps are usually prohibited in eczema, but they may occasionally be used with advantage: in suppurating eczema of the scalp, for example, it is recommended that the scalp be rubbed over with equal parts of **Ung. Sulphuris** and **Sapo Mollis**, washed a few minutes after with **Spiritus Saponis Kalinus** and then dressed as detailed above with **Sulphur Paste.** For very chronic patches, especially with lichenification and pruritus, **Solid Carbon Dioxide**, applied for twenty seconds to a minute, is very useful. For chronic scaly eczema of the toes and for indolent ulcers, the author recommends **Ung. Resinæ B.P.**, combined with **Sulphur** or with **Ung. Hydrarg.**

Knowles[6] has an elaborate study of *eczema in association with occupations*, and is sceptical of causations other than external. Of 1142 cases in his experience, fully one-fourth were of determinable external causation. The list of occupations concerned includes houseworkers (whose cause is chiefly soap), labourers, woodworkers, photographers, printers, painters, millworkers, bleachers and cleaners, cloth handlers, tanners, coopers, persons handling drugs and chemicals, confectioners, bakers, barbers, bar-tenders, handlers of grease, oils and glues, grocers, plasterers, paperhangers, tobacconists, furriers, workers in metals and minerals, dyers, fruit handlers, ice-cream makers, soap makers, packers, farmers, and florists. In the subsequent discussion of this paper, the vexed question was debated whether it was worth while keeping up a distinction between eczema and traumatic dermatitis, which are often indistinguishable by clinical or histological characters. Pusey neatly summed up the argument by remarking that the distinction is about as essential as that between natural and artificial ice. The whole debate is well worth reading in full. (*See also* SKIN, GENERAL THERAPEUTICS OF.)

REFERENCES.—[1]*Med. Chron.* 1913, Sept. 313; [2]*Med. Rev.* 1913, ii, 564; [3]*Brit. Jour. Child. Dis.* 1913, 505; [4]*Ther. Gaz.* 1913, 471; [5]*Med. Press and Circ.* 1912, ii, 402; [6]*Jour. Cut. Dis.* 1913, 11.

ELEPHANTIASIS.

Leonard Rogers, M.D., F.R.C.P.

F. C. Madden, A. Ibrahim, and A. R. Ferguson[1] record their experience of trials of **Lymphangioplasty** in elephantiasis, as suggested by W. Sampson Handley. They have applied the method in eight cases in Cairo under very favourable circumstances, but with uniformly disappointing results. As long as the patient is kept in the recumbent position after the operation, the effect is most gratifying, but when he begins to be up, no matter how long he may have been kept at rest, the leg becomes just as swollen as before the operation. As Handley pointed out, the effect of supplying new channels is done away with by the action of gravity, as no new motive force is supplied. They also found, both in their cases in man and in experiments in guinea-pigs, that the artificial lymph-channels do not persist for any length of time, but the lymphatics in the neighbourhood of the threads become obstructed after a while, on account of the reaction set up by the threads, with the formation of dense and progressively contracting fibrous tissue. Eventually the thread is penetrated by cells and converted into an impervious band of scar tissue.

REFERENCE.—[1]*Brit. Med. Jour.* 1912, ii, 1212.

EMPYEMA.

J. J. Perkins, M.D., F.R.C.P.

After a study of 114 cases, Holt[1] reiterates the great value of the **Siphon** treatment of empyema in infants and young children. The cause of death in acute empyema in children under three, at which period the mortality is very high, lies not in the advent of complications but in the disease itself, which therefore requires better management. Of the deaths from empyema in infants, 80 per cent are due to exhaustion from the long suppuration and general sepsis. For about a week after operation the children frequently do well, then the temperature rises and shows wider fluctuation, though the discharge is free, while expansion of the lung is imperfect. Then follows progressive weakness and asthenia. The 154 cases (all under 3 years of age) cover a period of seven years of hospital work, during which various modes of treatment were employed. For the first period of about three years, practically all cases were treated by simple incision and drainage; for the next period of about two years, the routine treatment was rib resection; for the past two and a half years nearly every case has been treated with siphon drainage. The advantages of siphon drainage are best shown if cases in patients under nine months of age only are considered: Rib resection, all cases fatal; simple incision, 8 cases, 1 recovery; siphon drainage, 8 cases, 3 recoveries. The method adopted is a modification of that introduced by Bülau, the founder of the treatment. A puncture incision is made with a small scalpel, the dimensions of the wound being slightly smaller than the drainage tube to be used. The tube should be firm and of large calibre, corresponding to a No. 27 French catheter. A collar is fixed round the tube to prevent it slipping into the cavity of the chest, and just above the collar a piece of broad tape is fitted, which is applied to the chest wall and held in place by adhesive plaster in such a manner as to close the opening into the chest and make it airtight. After introduction, the distal end of the tube is clamped with artery forceps until complete connections are made, the drainage tube being then joined to a longer tube which runs to an ordinary wash-bottle standing on the floor by the cot. This bottle contains about half a pint of sterile normal saline solution, beneath the surface of which the rubber tube opens. Continuous drainage thus takes place from the chest into the bottle without the admission of air into the pleural cavity. The average time of wearing the tube was 16 days, the longest time being 35 days, and the shortest 3 days. The advantages of the method are that it avoids all disturbance to the child by daily dressing, and especially that it promotes the expansion of the lungs by preventing free admission of air to the pleural cavity. Bülau's aim in introducing siphon drainage was to set up a negative pressure within the pleural cavity, and so to overcome the natural elasticity of the lung which is the main factor in the prevention of its expansion.

REFERENCE.—[1]*Amer. Med.* 1913, 381.

Priestley Leech, M.D., F.R.C.S.

Chandler[1] reports a case of empyema in a child five weeks old, who recovered after operation. The organism found was *Staphylococcus pyogenes aureus*. The child had an open branchial cleft just above the right clavicle which discharged pus, and this contained the same organism. Turner Thomas[2] has made a study of this condition in a body hardened in formalin, the seat of a right sided empyema which had not been opened during life. From this case he draws inferences which are rather at variance with some of the accepted views. The massive parietal type of empyema usually extends to the bottom of the normal pleural cavity, and is not general, but is completely walled off above from the rest of the pleural cavity by adhesions; this explains the slight mobility of the dullness on percussion on changing the position of the patient, as well as the fact that the upper level of the dullness is not a straight line, as it should be if the fluid was free to seek its own level. Skodaic resonance may not be due to relaxation of the lung above the pus, but to the fact that the functionating portion of the lung is doing compensatory work.

The most important factor in preventing obliteration of the empyematous cavity and closure of the sinus is the pressure of the air admitted through the drainage opening into the empyematous portion of the pleural cavity, where it neutralizes the expanding effect of the air coming through the trachea. Murphy overcomes this by aspirating the pus and injecting a formalin-glycerin solution, but his method has not yet received general approval. The ideal drainage method is that based upon the suction or syphon principle, but the apparatus in use allow air to leak round the tube. An opening through the eleventh rib or interspace of a given size will drain more perfectly than one at the usual level, and will better prevent the entrance of air, since the pus will be constantly escaping and tending to fill the space in and around the tube. He treated five cases of massive empyema by this method of dependent drainage, and the time of cure was less than the average.

REFERENCES.—[1]*Lancet*, 1912, ii, 1091; [2]*Amer. Jour. Med. Sci.* 1914, i, 405.

ENDO-BRONCHIAL TREATMENT.

W. G. Porter, M.B., F.R.C.S.

Heilskov and Mahler[1] have treated 27 cases of asthma by direct applications to the bronchi. All these patients had had previous medical treatment. The bronchoscope is passed in the sitting position, and the patient is warned to breathe quietly and not to cough. Ephraim's spray is passed down to the bifurcation, and a 3 per cent **Cocaine Solution** containing **Adrenalin** is injected into each bronchus. From eight to ten injections were made in each case. Of 4 cases of chronic bronchitis treated in this way, improvement was noted in 3, while 1 was not affected. Of the 27 cases of asthma, 5 were cured, 10 were improved, and 12 were not affected. Schoenthaler[2] has adopted the same treatment, but uses a ½ per cent solution of cocaine with adrenalin; of 17 cases, marked improvement has been noted in 16. He quotes Ephraim, who out of 58 severe cases obtained a cure in 37 and improvement in 14, while only 7 were unaffected.

REFERENCES.—[1]*Monat. f. Ohr.* 1913, 1037; [2]*Med. Klin. Woch.* 1914, 1189.

ENDOCARDITIS, ULCERATIVE.

Carey Coombs, M.D., M.R.C.P.

Of late, bacteriological and clinical research has defined for us the existence of a group of cases of endocardial ulceration presenting very definite symptomatic features, and apparently due in every case to a streptococcus of a certain type. Of course, endocardial ulceration may be produced by the ravages of almost any micro-organism: for instance Dean[1] records an example of generalized actinomycotic infection in which the endocardium was implicated. It is not, however, with such rare cases that we are now concerned, but with a group to which various names have been given—chronic ulcerative, infective, or septic endocarditis, endocarditis lenta, and so forth. Horder,[2] Libman,[3] Schottmüller,[4] Rosenow,[5] Major,[6] Jochmann,[7] Lewinski,[8] Schöne,[9] Lorey[10] and others, have called attention to the close association of this type of the disease, the clinical features of which are described below, with streptococci. This association is not, however, invariable: among Libman's and Horder's cases were several in which blood cultures yielded *B. influenzæ*; and Major mentions one from which the pneumococcus was grown, and another associated with *M. zymogenes*. For all practical purposes, however, it may be said that recent work has defined a form of slowly progressive ulceration of the endocardium due to streptococci.

The classification of this streptococcus is a difficult matter. Most agree that its characteristics are fairly constant. Libman contents himself with calling it the endocarditis coccus; Schottmüller calls it *Streptococcus viridans*; Rosenow belives it to be a modified pneumococcus; while Horder and others insist on its close similarity to the saprophytic cocci of the alimentary tract. In connection with the latter fact, it is important to note that oral sepsis is regarded by Jochmann and others as providing a possible port of entry for the infective agent.

Among the various interesting side-issues of this bacteriological problem is one of some practical importance: What is the relation of this streptococcus to that of rheumatic infection? Poynton and Paine[11] have very ably set forth their reasons for believing that there is a directly and purely rheumatic form of malignant endocarditis: a history of acute rheumatism is the rule, especially in the type of ulcerative endocarditis under discussion; the micrococci recovered from the latter are at least very like those associated with acute rheumatism; experimental inoculations with these cocci produce a simple type of endocarditis in some animals and a malignant type in others; and finally, it is hard to draw a line between rheumatism and malignant endocarditis from the clinical viewpoint. The present writer, however,[12] failed to find histological proof of rheumatic infection even in the most "rheumatic" cases of malignant endocarditis; though Palfrey and Ayer[13] describe a case of endocardial ulceration with myocardial lesions, some of which were like those of rheumatism. The whole question is part of the larger one, as yet unanswered, of what constitutes identity on the one hand or diversity on the other among the streptococci.

Apart from the frequent history of rheumatic fever, the most important among the predisposing causes of endocarditis lenta is the patient's age, which lies usually between twenty and forty.

PATHOLOGY.—Libman thus describes the lesions: "When the mitral valve is involved, as it is in the larger number of cases, there is a tendency for the vegetations to spread up on the left posterior wall of the auricle more than on the valve itself. Often the chordæ tendineæ attached to the posterior flap are covered to a greater or lesser extent by vegetations. Nearly always the anterior flap is also involved, and here the vegetations tend to grow down over the chordæ tendineæ, the involvement of the latter being often extensive. Not uncommonly the chordæ are ruptured, the torn ends at times being massed together by vegetations at the edge of the flap, or the lower ends may be found lying loose near the papillary muscles. The vegetations are yellowish, greenish, pinkish, or reddish in colour, and vary much in size in different cases. As they grow older they become firmer and assume a more greyish colour. When the aortic valves are involved there may be only a small vegetation on one or more of the flaps of the valve. On the other hand, there may be enormous green masses that must block the orifice to a greater or lesser extent. The vegetations have a tendency to extend down over the endocardium at the position of the septum membranaceum and over the ventricular aspect of the aortic flap of the mitral valve and down over the chordæ tendineæ. At times they have a stalactite-like appearance. There may develop an aneurysm of the aortic flap of the mitral valve. Ulceration of the aortic valve at times occurs; ulceration of the mitral flaps is rare."

In thirty-four cases he found the auricular endocardium attacked twenty-five times, the mitral flap twenty-eight times, the chordæ twenty-seven times, and the aortic cusps nine times only. One fact of particular importance is a tendency to healing on the part of these lesions; a possibility also alluded to by Amsler[14] and Marxner.[15]

Baehr[16] has examined the kidneys from cases of chronic ulcerative endocarditis. He finds certain glomerular changes associated with the streptococcal cases, but not with those due to other organisms. These changes consist of a gradual necrosis of part or the whole of the Malpighian tuft, proliferation and subsequent necrosis of the epithelium of Bowman's capsule, and gradual replacement of the necrotic mass by newly organized connective tissue. Cocci were found in these lesions.

SYMPTOMS.—The clinical picture presents certain definite peculiarities. The onset is very insidious; progressive weakness is often noticed first. Fever is moderate, and may even be continuously absent for weeks. Rigors and excessive sweating are exceptional. Articular pains with or without slight swelling of joints are the rule. Libman finds tenderness over the lower sternum a common symptom, and ascribes it to abnormal regenerative activity of the marrow. Painful nodules under the skin, like small patches of erythema nodosum, are often noted, and particularly on the fingers (Osler). Petechiæ and retinal hæmorrhages are common. The complexion is pale, a brownish pigmentation developing later on the face and even over the trunk (Libman). The blood shows a progressive fall in red corpuscles and hæmoglobin; leucocytosis may occur, but it is not constant. Weakness and wasting are usually conspicuous. The physical signs of valvular disease are usually, but not invariably, discovered. The spleen is generally enlarged, sometimes in a conspicuous degree. There are often evidences of a hæmorrhagic nephritis.

In any case where a suspicion of chronic ulcerative endocarditis is entertained, the only sure way of diagnosis lies in blood cultivation. The technique of this procedure was described in the MEDICAL ANNUAL for 1911, and need not be repeated here. The identification of the streptococcus, if this be the organism found, is not an easy matter, and should be entrusted to a bacteriologist with special knowledge of the matter.

PROGNOSIS.—While the general outlook is gloomy, it is legitimate to take note of the very substantial evidence adduced by Libman and others in favour of the possibility of cure in cases of chronic ulcerative endocarditis. Libman says that in such cases the patients may eventually die of uræmia; they may display evidences of valvular disease with very little sign of active infection, the final upshot of such cases being as yet unknown; they may die of broken compensation. In patients whose infective process is dying out, he says the fever is less marked and there are longer afebrile periods, the painful nodules are much less likely to appear, and petechiæ and renal hæmorrhage are far less abundant; but the spleen remains large, and arthralgias and sternal tenderness are no less pronounced.

TREATMENT.—A few cases of recovery are on record, but since it is possible that cure may be effected by natural means, too much importance must not be attached to the methods used. For example, Jochmann had two recoveries out of seven cases; three of his patients were treated with autogenous **Vaccines** and **Sera**, but two died. One of the recoveries was therefore associated with this treatment, while one was not.

Hemsted[1] records an extremely interesting case, that of a young woman with a congenital cardiac defect, whose endocardium became infected with a streptococcus of the type alluded to above. The symptoms were alleviated by a vaccine made from organisms grown from the circulating blood, but this did not effect a cure. A serum was, however, prepared from a horse inoculated with the patient's organism, and injection—with later oral administration—of this was followed by an apparently complete cure. Vaccines were given in conjunction with the sera. It is advisable to give a trial to these methods wherever possible. In one of Lorey's cases, an unusually acute one for this type of streptococcus, recovery occurred; improvement began shortly after a single ·6 c.c. dose of **Salvarsan** given intravenously.

[Attention to all possible parts of entry is absolutely essential: it is especially necessary to eradicate oral sepsis as far as possible.—C. C.]

REFERENCES.—[1]*Brit. Med. Jour.* 1912, ii. 1303; [2]*Quart. Jour. Med.* 1908, ii. 289; [3]*Amer. Jour. Med. Sci.* 1912, ii. 313; [4]*Münch. med. Woch.* 1910

180; ⁵*Jour. Med. Res.* 1912, xx, 421; ⁶*Johns Hop. Hosp. Bull.* 1912, 320; ⁷*Berl. klin. Woch.* 1912, 430; ⁸*Ibid.* 1912, 441; ⁹*Deut. med. Woch.* 1912, 579; ¹⁰*Jour. Amer. Med. Assoc.* 1912, i, 1824; ¹¹*Quart. Jour. Med.* 1912, July, 463; ¹²*Lancet*, 1912, i, 1527; ¹³*Boston Med. and Surg. Jour.* 1912, ii, 55; ¹⁴*Corres.-Bl. f. Schw. Aerzte,* 1912, Apr. 10 (*Brit. Med. Jour.* Epit. 1912, ii, 23); ¹⁵*Wien. klin. Woch.* 1912, 1269; ¹⁶*Amer. Jour. Med. Sci.* 1912, ii, 267; ¹⁷*Lancet*, 1911, i, 110.

ENURESIS.

Frederick Langmead, M.D., F.R.C.P.

DIAGNOSIS.—J. W. Simpson¹ points out that although there are a number of congenital malformations which may cause enuresis, only two of these are likely to lead to mistakes in diagnosis—epispadias in a female, and a congenital deficiency between the bladder and vagina. If there are no such defects, the mental state of the patient may be at fault. Although a definite case of idiocy would not fail to be recognized, 'backwardness' might be overlooked. Enuresis associated with pain during micturition may be due to well-marked hyperacidity of the urine, but other possibilities should not be lost sight of, such as stone in the bladder, phimosis with balanitis, a narrow meatus frequently with a small ulcer at its margin, or rarely tuberculosis of the bladder. New growths of the bladder and acute cystitis also cause painful micturition, but other more noticeable symptoms and signs at once differentiate them from simple cases of incontinence. If stone be present, the enuresis usually occurs during the day when exercise is being taken, pain is felt apart from micturition, and a small amount of pus is nearly always present in the urine. A bimanual examination, with one finger in the rectum, will probably discover a stone if present. Certain conditions, by causing reflex irritation, may prolong the duration of incontinence. Thus phimosis, vulvitis, thread-worms, and anal fissure may be named as contributory causes, but the curing of these conditions does not of itself remove the incontinence. Only rarely, except in the case of removal of adenoids, will attention to subsidiary causes accomplish this.

TREATMENT.—For cases of simple incontinence, Simpson has often found change of air and scene very beneficial. As incontinence often occurs during the first two or three hours of sleep, the child must pass water immediately before going to bed. Two hours afterwards the child should be roused from sleep and the bladder emptied again. This is especially indicated if the urine is alkaline. It is also important to establish regular habits of urination during the day, and the child should be encouraged to retain the urine as long as possible, even at the risk of some discomfort. The amount of fluid taken during the day should not be restricted, but the last meal and fluid should be taken at least one hour before going to bed. Tea and coffee should never be given. He has not found tilting the foot of the bed, or the usual methods of preventing the child from lying on its back, of definite value. Plenty of fresh air and a fair amount of exercise he considers important factors in effecting a cure.

He places reliance chiefly on three drugs: **Belladonna, Citrate of Potash,** and **Urotropin.** To use them intelligently it is necessary, in his opinion, to examine the urine carefully. If this is normal, the treatment consists in giving a tonic medicine, and afterwards belladonna. He begins with 10 min. of the tincture two or three times daily, and gradually increases it to 20 or 25 min. Sometimes the urine is extremely acid, loaded with urates, of high specific gravity, and diminished in quantity. Under these circumstances one must first reduce the acidity of the urine by using citrate of potash in doses of 10 gr. thrice daily, or larger doses if necessary. When the acidity has been reduced, the belladonna should be begun. Meat is contra-indicated. Sometimes the urine is neutral or alkaline, of low specific gravity, and contains triple phosphates, with perhaps a few pus cells and a trace of albumin. In these cases dieting is of first importance, carbohydrate food, as far as possible, being prohibited. If the urine is very alkaline, **Acid Sodium Phosphate** may be given; when the alkalinity has been reduced, belladonna should be used. If the urine contains *B. coli communis*, it is wise at first to reduce the acidity by administering citrate of potash; and then urotropin, 5 or 10 gr. thrice daily, often proves of immediate benefit. If there is a mixed infection, **Salol** is often useful, or a **Vaccine** may be employed with advantage.

He has rarely seen good results from **Antipyrin** or **Suprarenal Extract,** but advocates trying **Ergot** if belladonna fails, and **Thyroid Extract** if the child is mentally backward.

If the child is highly nervous and suffers from disturbed sleep or night-terrors, the addition of 5 or 10 gr. of **Potassium Bromide** to the last dose of belladonna at night often does good.

Epidural Injections and **Lumbar Puncture** he considers too drastic except in very extreme cases.

REFERENCE.—[1]*Edin. Med. Jour.* 1913, i, 49.

EPILEPSY. (*See also* BRAIN, SURGERY OF.)

Purves Stewart, M.D., F.R.C.P.

TREATMENT.—The advantages of a **Chloride-free Diet** in epilepsy are now so well recognized that it is unnecessary to discuss the régime in detail. Suffice it to state that the withdrawal of chlorides appears to render the organism more sensitive to bromides, so that a smaller dose of bromide is efficient in controlling the epileptic fits. Viteman, in his thesis of 1906, records the results of examination of the cerebrospinal fluid in a series of epileptics. He found a slight excess of chlorides, amounting to 7 or 7½ grams per litre, instead of the normal 6 grams. A chloride-free diet, in addition to diminishing the frequency and intensity of the fits, produces a corresponding diminution in the chloride content of the cerebrospinal fluid. Conversely, Sicard and Javal have shown that excess of chlorides in the diet of epileptics produces an increase of chlorides in the cerebrospinal fluid.

Netter[1] maintains that **Calcium Salts** have a special sedative action on the cerebral cortex, being antagonistic in this respect to sodium salts, which are stimulant. He therefore urges the administration of calcium salts in addition to a chloride-free diet.

SURGICAL TREATMENT.—This has been undertaken from time to time by numerous observers, such as Alexander, of Liverpool (MEDICAL ANNUAL, 1909), and others. Recently Tilmann,[1] of Cologne, has discussed the indications for surgical intervention in idiopathic epilepsy. At the outset he strikes out, as unsuitable, all cases of neuropathic heredity, with a family history of mental disease, epilepsy, or alcoholism; also cases of hysteria and hystero-epilepsy, together with syphilitic or alcoholic patients. Further, he excludes the epileptiform attacks of uræmia, malaria, and other toxic or infective diseases. The cases where surgical intervention is worth considering are those in which a previously healthy patient, without neuropathic heredity, suddenly or gradually becomes epileptic, often after some trauma. Depressed fractures of the skull call for prompt operation. Even apart from this, injuries to the skull can induce epileptic fits in previously healthy individuals. Thus a hospital nurse fell and struck her head on the stone floor of an operating theatre. Without any signs of local trauma a series of sixteen severe epileptic fits followed. **Lumbar Puncture** withdrew 30 c.c. of blood-stained fluid. The fits ceased at once, and up to the time of publication, now three years ago, have not recurred. As regards **Trephining** for traumatic epilepsy, the best results are obtained by early operation. In some cases, by careful observation, we can detect evidence of a focal lesion, whether in the form of a localized scar or depression, or local paralytic or irritative phenomena, which serve to indicate the spot for trephining. Jacksonian fits are of great diagnostic value, but only in cases where the trauma has occurred in the region of the central fissure. But even in generalized fits following head injuries Tilmann claims to have obtained occasional successful results. In two such cases he found evidence of a local trauma in childhood, although the fits did not appear till six or ten years later. Nevertheless, careful examination of the cranium showed local tenderness at the site of the injury in one instance and a scar in another. Trephining revealed adjacent chronic periosteal thickening, and the fits were permanently cured. Even in non-traumatic idiopathic epilepsy Tilmann has frequently trephined. He states that in about 50 per cent of cases the dural tension is above the normal, and that, in such cases, on incising the dura the arachnoid is œdematous and swollen, and the subjacent veins of the pia dilated and varicose. Out of 42 cases operated on by Tilmann, 2 died, one from shock, another from pneumonia. Of the remaining 40 cases, 12 remained free from fits for four months and upwards, and 8 of these had been free for over three years. In 3 cases the fits continued, though less severely, whilst in 25 no improvement followed, and in 2 of them the disease was aggravated. Radiographic examination of the skull occasionally affords valuable indications.

Returning to medicinal treatment, it is worthy of note that in a certain number of epileptics, as indicated by Claude and Schmiergeld,[2] there is evidence of thyroid deficiency. Such patients are remarkably benefited by **Thyroid** medication, either in association with bromides as indicated by Claude, or independently of bromide treatment as in two cases recorded by Gelma.[4]

Lastly, it is of interest to record further observations on the **Crotalin** treatment of epilepsy, originally introduced by Spangler, of Philadelphia, with which readers of the MEDICAL ANNUAL are already familiar. In more recent publications Spangler amplifies his favourable results, based on the observation of 148 cases in three and a half years. The mode of preparation of the crotalin is as follows: The fresh snake-venom is obtained by causing the snake to bite on the edge of a glass funnel, the venom running into a bottle beneath. The venom is spread on glass and allowed to dry, forming a yellow substance which, when broken up, forms scales of somewhat crystalline aspect. In this dried state it keeps indefinitely without deterioration. When required for use it is dissolved in sterile water and glycerin, to which are added a few drops of trikresol as an antiseptic. This sterile antiseptic solution is then sealed up in glass ampoules containing from $\frac{1}{200}$ gr. to $\frac{1}{20}$ gr. of the dried venom. The strength of dose varies with different individuals, and it is prudent to begin with $\frac{1}{200}$ gr., injected intramuscularly, every five or seven days, gradually increasing to $\frac{1}{10}$ gr. or more, according to the technique already described (*see* MEDICAL ANNUAL, 1913, p. 230).

The foregoing treatment being frankly empirical, Spangler has endeavoured to find a rational explanation of the beneficial results so obtained. He offers an explanation in the fact that crotalin contains at least two active principles, of which one, a peptone, has a paralyzing effect on nerve-tissue, whilst the other, a globulin, acts on the blood, diminishing or destroying its coagulability. He points to the increased coagulability of the blood which sometimes, for twenty-four or forty-eight hours, immediately precedes an epileptic fit, and quotes in support of this thesis John Turner and Aldren Turner. Woodruff, of Rochester (New York), also supports Spangler's views; but the value of his evidence is somewhat diminished by the fact that he claims crotalin as a cure, not only for epilepsy, but also for asthma, neuralgia, neuritis, lumbago, sciatica, coccygodynia, tics, chorea, functional aphasia, pleurisy, and phthisis. All this is too good to be true.

REFERENCES.—[1]*Soc. Méd. d. Hôp.* 1907, Mar. 8; [2]*Munch. med. Woch.* 1912, 2083; [3]*L'Encéphale*, 1909, Jan. 1; [4]*Rev. de Méd.* 1913, 26.

ERYSIPELAS.

E. Graham Little, M.D., F.R.C.P.

Arnold[1] adopts and recommends a "country remedy" for erysipelas in the internal and external administration of **Buttermilk.** Dressings soaked in this fluid are applied freely to the inflamed surface and kept continually wet, and the patient is encouraged to drink it as well.

REFERENCE.—[1]*Pract.* 1913, i. 900.

ERYTHEMA AB IGNE.

E. Graham Little, M.D., F.R.C.P.

Hartzell[1] remarks on the infrequency of this condition in America, and the scanty reference to it in text-books, and records some cases of interest, notably one in which the curious mottling characteristic of the disease was produced by application of a hot-water bottle on the lumbar region. The author regards general ill-health as a contributing cause. Histological examination of the pigmented and erythematous stages of the disease showed clearly that the affection is inflammatory, and not simply a staining of the skin by blood pigment.

Directions as to TREATMENT may be summed up in the caution to **Avoid Local Heat**, especially that of an open fire. In early stages **Cooling Lotions** and **Pastes** may be applied with advantage.

REFERENCE.—[1]*Jour. Cut. Dis.* 1913, ii, 401.

ERYTHEMA COMPLICATING INFECTIOUS DISEASES.

E. W. Goodall, M.D.

Weill and Gardère[1] have published an account of several cases of secondary erythema occurring during or soon after an attack of measles. They discuss at length the diagnosis and pathology, without arriving at any very definite conclusion on the latter point, except that usually these rashes are to be taken as evidence of some secondary infection, especially by streptococci, and that they are due to an intoxication and not to an invasion of the blood by micro-organisms. They dismiss the hypothesis that the rashes and the other symptoms which may also be present are due to hepatic, renal, or adrenal insufficiency, on the ground that these conditions are by no means constantly present. Some account was given of these erythemata in last year's ANNUAL.

REFERENCE.—[1]*Rev. de Méd.* 1913, 430.

ERYTHEMA NODOSUM.

E. Graham Little, M.D., F.R.C.P.

Gosse[1] has investigated anew the supposed *relation between erythema nodosum and rheumatism*, concluding that the evidence for any causal connection between these affections is extremely scanty. He bases his arguments on the careful study of 100 cases of erythema nodosum occurring at St. Mary's Hospital in the last 12 years. He also rejects the now more prevalent view that erythema nodosum is a form of erythema multiforme, and regards the disease with Trousseau, Landouzy, and others, as *sui generis*, an "infective disease of separate entity." In one set of these cases in his series there was apparent infectivity, the incubation period being a fortnight, and he claims that this observation is not of rare occurrence. But no specific germ has yet been discovered.

Tonsillitis was the most frequent association with erythema nodosum in the hundred cases analyzed. A systolic murmur at the apex and pains in the joints come next in frequency; the heart symptoms usually disappear within two or three weeks. The rash may be ushered in by shivering, rigor, headache, vomiting, and anorexia; in severe cases by pain in the back and joints and effusion in the latter. Pyrexia may precede the eruption, and usually persists for some days, the temperature becoming normal within a week. There was not a single instance in the hundred cases of a repeated attack in the same person. Salicylates, even when pushed to heroic doses, were quite without effect either on the pyrexia or on the symptoms. There is no specific treatment, and beyond ensuring **Rest in Bed** little need be done. The convalescence is often prolonged on account of the severe anæmia which is a frequent sequel.

An interesting pendant to this paper is found in a contribution by Meara and Goodridge,[2] who espouse the view that tuberculosis may be one of the causes, which are multiple, of erythema nodosum. The throat is the portal of entry for the infection in many instances. The authors describe in detail a remarkable case of erythema multiforme and erythema nodosum together, occurring in a young woman, apparently as an early manifestation of tuberculosis terminating in death from meningitis.

REFERENCES.—[1]*Pract.* 1913, ii, 240; [2]*Amer. Jour. Med. Sci.* 1912, i, 393.

ERYTHRÆMIA. (*See* POLYCYTHÆMIA.)

EYE, GENERAL THERAPEUTICS OF. *A. Hugh Thompson, M.D.*

Hydrogen Peroxide.—As a non toxic antiseptic this is strongly to be recommended as an alternative to other drugs in *conjunctival, corneal, and post-operative inflammations.* Its most serious drawback, says Harry,[1] is the danger of using it with any of the silver salts. Another very slight disadvantage is that the frothing produced may be a source of alarm to patients. The strength recommended is that of the B.P. solution, namely 3 per cent.

P. Knapp[2] recommends 2 or 3 per cent of **Resorcin** in a saturated solution of boracic acid for cases of *chronic conjunctivitis*, especially when zinc sulphate causes irritation.

Carbon-dioxide Snow (*see also* MEDICAL ANNUAL, 1913 236) has been proved inferior to the old remedies in the treatment for *trachoma* at Vienna, in Prof. Fuchs' clinic. "It was found," says Ernest Thomson,[3] "when carbon dioxide snow and copper sulphate were employed one against the other in the right and left eyes of the same patient, that there was distinctly more scarring with the snow than with the copper." As time went on, this became such a convincing fact that the snow was given up.

Darier, of Paris,[4] employs **Radium** in *rodent ulcer* and *epithelioma of the eyelids*, in *spring catarrh*, and in *chalazion*. "In the last-named affection he finds that a couple of applications, each of twenty minutes' duration made at intervals of a fortnight, suffice to cure many cases without recourse to operation."

Diaphoresis is a time-honoured method of treatment, but while it has always been largely employed by a few ophthalmic surgeons, and occasionally by many, in such diseases as sympathetic ophthalmia, the cumbersome apparatus required for vapour baths, and the depressing effects that frequently follow pilocarpine injections, have tended very much to limit its employment. In the external application of guaiacol, we have a method which escapes both these drawbacks. In advocating this, Russ Wood and F. A. Anderson[5] point out that its object is to procure the absorption of toxins by the blood, not directly, for it is doubtful if any toxic substances are got rid of by the skin, but indirectly:

but as a necessary result of excretion of water by the sweat glands, the blood is made thicker, and absorbs more fluid from the body tissues. The toxins are absorbed along with the fluid, and are excreted by the natural channels. The method of application is as follows: The patient is given an aperient over night, and a very hot bath in the morning, after which he is put to bed between blankets with hot-water bottles. The guaiacol pigment, which consists of equal parts of guaiacol and olive oil, is now applied, two drachms of this mixture constituting the average dose. This amount is poured on a piece of lint six inches square, and is then smeared (not rubbed) over an area of the epigastrium about the size of the lint. The piece of lint is now applied over the area so treated, and the whole covered with oiled silk, which is fixed in its place by strapping, and left in position for about four hours. A glass of hot lemonade or peppermint water may be given at the commencement. The authors have used this treatment for *retrobulbar neuritis*, *papilledema*, *vitreous opacities*, *chronic irido-cyclitis* (especially if of traumatic origin), *non-ulcerative keratitis*, and the various ocular manifestations of *syphilis*.

Favourable accounts of **Hetol**, in the treatment of *tuberculous iritis*, have from time to time appeared in Germany. Pflüger, Wicherkiewicz, and others have used it in the form of subconjunctival injections. Cohn, of Mannheim,[6] finds that in the form of a solution of 2 to 5 per cent simply dropped into the conjunctival sac, it is equally effective.

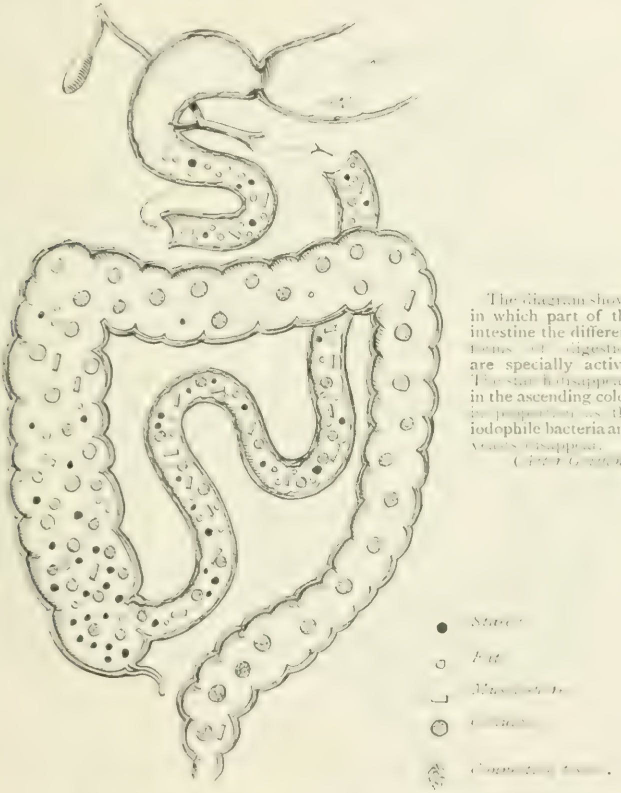
H. P. Bennett, of Newcastle,[7] reports a remarkable case of retinitis proliferans with retinal hæmorrhages in a young woman of twenty-three, in which mercury, potassium iodide, iron, and calcium lactate had all been tried without success, but which yielded to **Thyroid Extract**, so that the vision, which had been right $\frac{6}{24}$, left $\frac{6}{60}$, improved in seven months to right $\frac{6}{9}$ partly, left $\frac{6}{18}$. For four months she took 1 gr. of thyroid extract thrice daily, and for a further two months 1 gr. once daily.

Local Anæsthesia for Enucleation of the Eyeball.—This is the usual routine procedure in the clinic of Professor Siegrist of Berne. The procedure employed is described by Ernest Thomson,[8] who testifies that in the three operations that he saw, neither patient gave any evidence of pain. The conjunctival sac is cocainized in the ordinary way, and a 1 or 2 per cent solution of novocain, to which, after sterilization, a few drops of adrenalin (1–1000) have been added, is used to produce anæsthesia of the deeper parts. About 5 c.c. of this solution are injected by means of a long specially-curved needle, 2 c.c. on the temporal side, 2 c.c. on the nasal side, deeply behind the eyeball, and an additional 1 c.c. in the neighbourhood of the muscles. The stronger solution is suitable for young and robust patients, the weaker for the old and decrepit. A sedative is given ([illegible] grains veronal) the night before, and also half an hour before operation.

REFERENCES.—[1]*Prescriber*, 1913, 198; [2]*Ibid.*; [3]*Ophthalmoscope*, 1913, 139; [4]*Ibid.* 130; [5]*Ibid.* 137; [6]*Münch. med. Woch.* 1913, 359; [7]*Ophthalmoscope*, 1913, 70; [8]*Ibid.* 1913, 144.

FÆCES, EXAMINATION OF. (*See also* AMŒBIASIS; CANCER, LABORATORY DIAGNOSIS OF; PANCREAS, FUNCTIONAL EFFICIENCY OF.) *O. C. Gruner, M.D.*

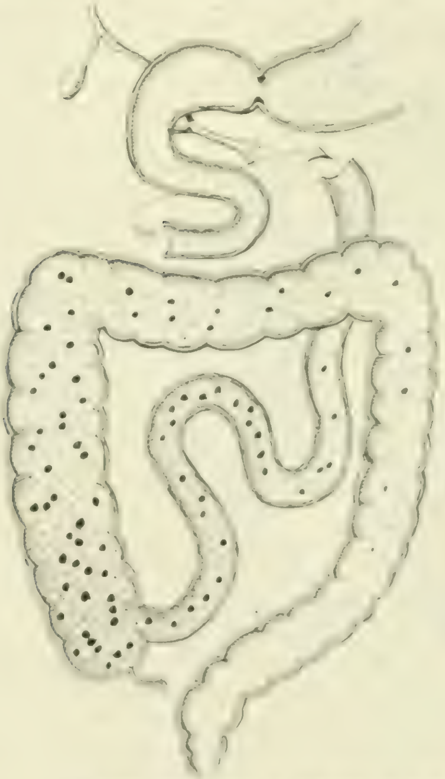
The clinical examination of fæcal matter is laid stress on by Goiffon,[1] who points out that no deductions can be made from a laboratory study of the material unless it represents the relics of a special diet. The volume, colour, consistence, aeration, odour, and microscopic examination are investigated. A portion is teased out with water and ground up in a mortar. Normally, the supernatant fluid should be free from particles, while the deposit shows a few deformed muscles, fibre cells, starch granules, soaps, and undigested vegetable débris as the only constituents. The signs of insufficient digestion are abundance of muscle fibres, bacteria stainable with iodine, leucocytes, red cells, crystals of oxalates, and ammonio-magnesium phosphate. An acid reaction points to fermentation of hydrocarbons, while an unduly alkaline reaction means proteolytic putrefaction.



The diagram shows in which part of the intestine the different ferments of digestion are specially active. The starch disappears in the ascending colon in proportion as the iodophile bacteria and yeasts disappear. (*After Goiffon.*)

Fig. [illegible].—Representation of Activity of Digestion in the Intestine.

The following indicate the presence of ulceration: the occurrence of a precipitate, leaving a clear fluid, on adding saturated mercuric chloride (test for albumin), the presence of blood, and of pus cells in large number. The fæcal characters of certain intestinal disorders are given as follows. False diarrhœa: more or less fluid consistence, brown colour, alkaline reaction, putrid odour; no food relics. Intestinal irritation: mucus liquid full of nucleo-protein, easily putrescible. Colitis of ascending colon: watery, nucleoproteid or mucus present, insufficient digestion of food. Colitis of descending colon: very liquid, with abnormal putrefaction. Intestinal fermentative dyspepsia: excessive fermentation of hydrocarbons; very acid reaction, abundant gas, richness in iodophile flora. Pancreatic achylia: abundant, watery, alkaline fæces, with neutral fat, muscular fibres, no amylase. (See also Figs. 18, 19.)



The larger black [illegible] The varying [illegible] relative [illegible]

Fig. 20.—Distribution of Mucus in the Intestine.

Ova.—A good method, devised by Yaoita, is strongly recommended by Wahl.* Five different pea-sized parts of the fæces (taken as fresh as possible) are placed in a test tube with 25 per cent antiformin (pure antiformin would destroy the ova) and an equal volume of ether. Agitation causes the fæcal matter to dissolve, with rapid evolution of gas. Filter through a hair-sieve, centrifuge the filtrate for a minute, and examine the deposit.

REFERENCES.—[1]*Presse Méd.* 1913, 945; [2]*Berl. klin. Woch.* 1913, 301.

FAVUS. (*See* RINGWORM.)

FIBROSITIS.

Herbert French, M.D., F.R.C.P.

A. P. Luff,[1] in his Harveian Lecture, discusses this subject in so informing a manner that we have ventured to quote from it at some length. He says, "In the great majority of the cases of so-called chronic rheumatism, the pathological change is in the white fibrous tissue in various parts of the body, and to this condition the term 'fibrositis' has been very aptly applied. The essential pathological change is an inflammatory hyperplasia of the white fibrous tissue in various parts of the body, associated with exudation and proliferation of the connective-tissue elements, leading to swelling and thickening of the affected fibrous tissues. This condition may undergo absorption, and so completely disappear; or, if not suitably treated, it may pass on to organization, with the formation of nodules and patches of thickening.

"The articular structures proper—synovial membrane, cartilage, and bone—are not primarily affected, but the parts implicated are the fibrous tissues of the joints, muscles, and bones, especially the aponeuroses and insertions of the muscles, the muscle sheaths in which the muscle spindles lie, the bursæ, fasciæ, the fibrous ligaments and capsules of the joints, and the periosteum. Such affections cause pain and stiffness in these structures, are especially apt to recur, and are commonly referred to as rheumatic or even gouty in their origin. The inflamed and swollen fibrous tissue is tender, painful on pressure or on movement, and can frequently be felt on palpation, or is evident by the consequent elevation of the skin. Sudden movement of the affected muscles generally causes excruciating pain, while the local pain on pressure is one of the most diagnostic features of these cases. The indurations may be widespread, but generally are well defined, and vary in size from ¼ in. to 1 in. in diameter. They may be situated in the subcutaneous tissue, the muscles, tendons, aponeuroses, the capsules and ligaments of the joints, the bursæ, the sheaths of the nerves, and periosteum. The pain is especially aggravated by any sudden movement of the muscles which compresses or stretches the affected fibrous tissues and the sensory nerve filaments."

The fibrositis may sometimes have a microbial cause; but in most cases this cannot be traced, and the chief factors which predispose to it are cold, damp, and wet; extremes of heat and cold; local injuries, recent or past; and the absorption of irritating toxins from the alimentary tract, inflamed tonsils or pharynx, or other focus. Not infrequently the focus cannot be found, but exacerbations of the toxic factor are indicated by associated symptoms often labelled febricula or influenza. The white fibrous tissues in practically any part of the body may be affected, but the liability is greater in certain situations, the most familiar types of the condition being those presented in the guise of "muscular rheumatism." Dupuytren's contraction of the palmar fascia, fibrositis of the plantar fascia, of bursæ, or of joints, and similar affections of the subcutaneous tissues far removed from joints.

TREATMENT.—*General.*—" A **Saline Aperient** should always be given at the onset of an attack of acute fibrositis, and repeated as necessary. If the attack is a severe one, confinement to bed may be necessary, and it is important to recognize the beneficial influence of **Rest** in such cases. For severe attacks of lumbago and intercostal rheumatism, firm strapping with the brown holland strapping plaster secures the necessary local rest of the affected muscles. In all cases of brachial fibrositis the arm should be carried in a sling, and should be moved as little as possible during dressing and undressing.

" In the treatment of the different forms of fibrositis, salicylates are of little curative value, as they do not exercise the same specific action as in acute rheumatism. **Aspirin** is of decided use for the relief of pain in severe cases, but it should only be given with that object. It acts better than sodium salicylate owing to the fact that the introduction of the acetyl radicle increases the analgesic action of the salicylic acid. It probably also exercises a beneficial effect in cases of abnormal intestinal fermentation. Perhaps the best method of administering this drug for the relief of pain consists in giving 10 gr. of aspirin with 5 gr. of pyramidon in a cachet every four hours. **Potassium Iodide** is in my experience the most valuable drug in the treatment of fibrositis. It seems to exercise a direct effect in removing the hyperplasia and serous exudation in the fibrous tissues. It should always, if possible, be given in full doses of 10 or 15 gr., and should be combined with **Tonics**, such as nux vomica or the compound glycerophosphate syrup. If the iodide produces severe symptoms of iodism, one of the organic iodine compounds may be tried. Of these I have found **Iodipin**, in the form of tablets, extremely useful.

" Fibrolysin is a chemical combination of thiosinamin and sodium salicylate, for which the claim has been put forward that it has a softening effect upon all forms of pathological fibrous tissue. In a former paper I reported on the use of it in a somewhat limited number of cases of fibrositis, and then gave a somewhat guarded favourable opinion as to its being of use in properly selected cases."

He is now obliged to modify this view, for in only 12 out of 84 more recent cases has the use of the injection been followed by a cure.

Local.—" In the early stages of an acute fibrositis, hot **Fomentations** are useful. Afterwards, one of the best external applications in my experience is a mixture of equal parts of **Chloral Hydrate, Camphor,** and **Menthol.** These three substances form a liquid when well rubbed together. The liquid should be painted over the painful area, and then be gently rubbed in with the fingers. Some patients find the cold sensation produced by the menthol objectionable; in such cases the menthol may be omitted and equal parts of chloral hydrate and camphor employed, which also form a liquid when rubbed together. Another useful external application is to paint the painful area with **Tincture of Iodine**, and then to apply a hot linseed poultice or a very hot fomentation. The heat converts the iodine into vapour, which exercises an anodyne effect, and, probably by absorption, acts directly on the affected fibrous tissues. In the later stages the **Aconite, Belladonna,** and **Chloroform** liniment applied on lint is frequently most beneficial. In cases of a very localized fibrositis, counter-irritation is sometimes of great use, especially in the form of the **Thermo-cautery.**

"In localized forms of fibrositis, and especially where fibrous deposits occur—such as in lumbago, thickening of the ligamentous and fibrous structures surrounding or entering into the composition of joints, deposits in muscles, tendons, and tendon sheaths, and in chronic villous synovitis of the knees—the most effective form of local treatment that I am acquainted with is the employment of **Heat,** followed by **Ionization** of the affected part. This treatment has a very remarkable effect in causing the absorption of thickened fibrous tissues. If heat is to be applied to the entire body, the electric-light cabinet bath is the most convenient form, but in the treatment of localized forms of fibrositis it is preferable to concentrate the heat on the affected part only, and I am confident that far better results are obtained from the employment of dry radiant heat than from the employment of heat alone. C. F. Bailey considers that the ideal type of radiant heat should be as nearly as possible like sunlight, and should give a spectrum ranging from the ultra-red to the ultra-violet. This type of spectrum can apparently only be obtained from lamps of a very high candle-power, such as the so-called leucodescent radiant-heat apparatus, which consists of a single 500-candle-power lamp in a funnel-shaped projector lined with a reflecting surface. The method of applying the heat is to sway the lamp slowly backwards and forwards over the affected part for about twenty minutes. It must be applied directly to the skin, and anything like a severe burning sensation should be obviated either by the temporary removal of the lamp or by brushing with the hand that part of the surface which is being treated. When the lamp is switched off, the part feels burning hot to the touch, and the surface is red and mottled from vascular dilatation. If such radiant heat alone is used, it very definitely relieves pain, softens fibrous indurations, and causes improvement in joints and their surroundings as regards flexibility and reduction in size. These results are, however, considerably enhanced by subsequent ionization.

"The exposure to heat should be followed immediately by ionization with iodine ions. The iodine is introduced into the affected tissues from a 2 per cent solution of lithium iodide, to which sufficient liniment of iodine has been added to give the fluid a sherry colour and so ensure the presence of an excess of iodine. Pads of lint six-fold thick are soaked in the hot solution and applied to the part to be treated. A copper chammail electrode is then spread over the pad and bandaged on, leaving the connection exposed, which is then attached to the negative pole. The positive pole is similarly connected to another pad soaked in a weak solution of common salt or of lithium carbonate. Another method, though not so efficacious as the employment of lithium iodide, is to paint the skin of the affected part with iodine liniment, and apply a pad soaked in a weak solution of lithium carbonate with the electrode connected with the negative pole, the positive being applied as before. The strength of the current that should be employed varies with individual patients, but should range from 15 to 40 milliamperes. The ionization lasts for twenty minutes, and should be repeated daily if the skin will stand the treatment, otherwise it should be used on alternate days. Many patients improve rapidly from the first, but in severe cases a course of daily applications for four weeks is required. While this ionization treatment is being carried out, it is very important that the administration of potassium iodide by the mouth should be continued.

"In cases of acute fibrositis, especially in acute lumbago and painful affections of the knees, shoulders, and elbows, it is advisable at the first two or three sittings to employ a 2 per cent solution of sodium salicylate in place of the lithium iodide, in order to produce immediate relief of the severe pain. The salicyl ion is introduced into the painful region, and it is remarkable how rapidly it will relieve the pain, just as salicyl ionization relieves severe neuralgia and some forms of neuritis."

Some observers have stated that the chlorine ion is quite as efficacious as the iodine ion, and is less caustic, but Luff's experience is that the iodine ion is more effective, and he has never met with any bad effects from its causticity. The improvement started by a short course of heat and ionization treatment will continue to progress for some days after the treatment is left off.

"In cases of lumbago, the **Static Wave Current** may be substituted for ionization. F. H. Humphris records excellent results with this form of treatment. It produces a local vibratory effect, and muscular contraction takes place, so that the wave current tends to remove the infiltration by squeezing out the serous exudation from the affected tissues, and thereby relieving the pain. From my experience of a number of cases that I have had successfully treated, I can thoroughly recommend the employment of local heat, followed by the use of the static wave current.

Massage is very useful in the later stages, but it should only be employed when it causes no pain. The manipulations should be very gentle at first, so as to promote removal of exudation and to relieve the tension. Afterwards more vigorous massage is most efficacious in dispersing the indurations and fibrous thickenings, and in removing the stiffness of the affected parts. General massage should not be employed, but the tender and affected areas should be carefully marked out for treatment. Massage should not be used to affected joints, but only around them, so as to improve the circulation in their neighbourhood.

"During the very painful stage of muscular rheumatism, as complete rest as possible of the affected muscles must be enforced, but later on **Exercises** of the muscles are of great benefit. Either light dumb-bells or Indian clubs, of from 1 lb. to 2 lb. in weight, should be employed, and such movements are to be performed as will bring the affected muscles into action. The exercises should be performed on rising in the morning, and should not occupy more than from ten to fifteen minutes. A cold or tepid bath should be taken afterwards, and the skin be briskly rubbed with a rough towel.

"In cases of chronic subcutaneous fibrosis in very fat people (adiposis dolorosa), massage is quite ineffective, and often unbearably painful. In such cases it is essential, first of all, to get rid of the superabundant fat by means of a strict diet, and by the administration of **Thyroid Gland.**

"**Spa Treatment** is most useful in protracted cases of fibrositis, especially when the waters are strongly radio-active. No special dieting is required in these affections. Moderation should be the keynote of all prone to the various forms of fibrositis, and especially should they avoid foods which their experience has taught them to be apt to produce gastro-intestinal fermentation. With regard to the underclothing that should be worn by rheumatic individuals, porous linen underwear is the most suitable. Some individuals find that in winter linen underwear is too cool, and in such cases a thin silk vest may be worn over the linen. This will be found to constitute a thoroughly warm, comfortable, and safe form of underwear."

The most suitable soil is gravel, sandstone, or rock, at a fair elevation, and with good subsoil drainage. Houses should be built on a bed of concrete, so as to prevent entirely the entrance of ground air. Residence on a clay soil should be avoided if possible, but in Luff's experience the worst soil of all is a shallow gravel soil in a cup or depression of clay, which allows the subsoil water to accumulate and frequently to reach close to the surface. Many of the gravel sites lauded by house agents are veritable traps for the development of fibrositis.

REFERENCE.—[1]*Brit. Med. Jour.* 1913, i, 756.

FOOT-AND-MOUTH DISEASE. *Herbert French, M.D., F.R.C.P.*

O'Brien[1] records a case of foot and mouth disease as it affected a veterinary inspector, the source of infection having been a sheep-bite. Three weeks after, an abscess developed, and a little later, redness and swelling of both hands and fingers, accompanied by great itching of the parts, with a few small raised white swellings like little lumps under the skin, especially round the nails. Shortly afterwards similar irritation spread to both feet, accompanied by a sensation of pin-pricks in the soles. The fingers and the dorsal aspect of both hands became markedly swollen, and covered over with a dull raised reddish rash, which stopped short abruptly an inch above the wrist. Immature vesicles were observed here and there over the surface of the rash, more especially in the clefts between the fingers and immediately above and around the nails. There was no perceptible involvement of the lymphatic glands. Vesicles were also observed on the inside of the lips, gums, and side of the tongue. Mastication, deglutition, and talking were painful, saliva was increased in amount, and the voice less distinct than normal. The temperature never exceeded 100° F. Seven days later, fresh vesicles had ceased to appear, and the patient ultimately made a complete recovery.

REFERENCE.—¹*Med. Press and Circ.*, 1913, i, 34.

FRACTURES.

Priestley Leech, M.D., F.R.C.S.

TREATMENT OF SIMPLE FRACTURES: REPORT BY A COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION.

The treatment of simple fractures has been thoroughly investigated by this Committee. The report is a voluminous one, and contains a mass of statistics, many illustrations, and articles by Lambotte, Lane, Lucas-Championnière, Steinmann, Bardenheuer, and Schrecker, on the various methods of treatment. The conclusions to which the committee came are as follows:—

1. The statistics of the non-operative treatment of fractures of the shaft of the long bones in children under 15 years of age, with the exception of both bones of the forearm, show as a rule a high percentage of good results. The relative figures are: In 1,017 non-operative cases, 96·5 per cent good functional results; in 64 operative cases, 95·3 per cent good functional results. It is possible, either by operative or non-operative treatment, to obtain a high percentage of good results in children.

2. In comparison with the non-operative results in children, the aggregate results of non-operative treatment in those over 15 years of age are not satisfactory.

3. From an analysis of the age groups, the functional result of non-operative treatment becomes worse as the age advances; the older the patient the worse the result.

4. In cases treated by immediate operation, the deleterious influence of age upon the functional result is less marked.

5. In nearly all age groups, operative cases show a higher percentage of good results than non-operative cases.

6. Although a functional result may be good with an indifferent anatomical result, the most certain way to obtain a good functional result is to secure a good anatomical result.

7. No method, whether non-operative or operative, which does not definitely promise a good anatomical result, should be accepted as the method of choice. For this reason, mobilization and massage alone have not been found to secure a high percentage of good results. They are, however, valuable supplementary methods of treatment. Similarly

operative methods which secure reposition and absolute fixation of the fragments yield better results than those which do not; imperfect fixation of the fragments by wire or other suture has been found to be an unsatisfactory procedure in the treatment of fractures of long bones, with the exception of the olecranon process of the ulna.

8. Operative treatment should not be regarded as a method to be employed in consequence of the failure of non-operative treatment, for the results of secondary operations compare very unfavourably with those of immediate operations. To secure the most satisfactory results from operative treatment, it should be resorted to as soon after the accident as practicable.

9. It is necessary to insist that the operative treatment of fractures requires special skill and experience, and such facilities and surroundings as will ensure asepsis. It is therefore not a method to be undertaken except by those who have constant practice and experience in such surgical procedures.

10. A considerable proportion of the failures of operative treatment are due to infection of the wound, a possibility which may occur even with the best technique.

11. The mortality directly due to the operative treatment of simple fractures of the long bones has been found to be so small that it cannot be urged as a sufficient reason against operative treatment.

12. For surgeons and practitioners who are unable to avail themselves of the operative method, the non-operative procedures are likely to remain for some time yet the more safe and serviceable.

Robert Jones[2] reviews the present position and criticizes the above report. He is confident, after reading it, that the question is not, "Must we prepare ourselves to admit that primary operation is to become the recognized routine?" but the two very real questions are, "Can we improve our non-operative technique so as to remove the discrepancies which are in some instances glaringly apparent?" and "Can we lay down any laws to guide us when we ought to operate at once?" Mal-union and non union are common occurrences, and are often correlated; it is of extreme importance to obtain correct alignment, and this can often be obtained if sufficiently strong traction is employed. In a femur with much displacement, especially in a strong muscular subject, it is well to employ a pulley, and not to be satisfied until the affected bone is of equal length with its fellow. Much can be done in old and obstinate cases by continuous and unyielding traction. Another cause of mal-union is inefficient splinting; the splint should be so constructed as to allow the continuance of extension, and prevent any deviation from the normal line; e.g., in fracture of both tibia and fibula in the middle of the leg, both bones are naturally slightly bowed, and if they are set too straight the weight of the body is deflected to the inner side, which involves a strained internal lateral ligament at the knee and a weak, painful, everted ankle. A third cause of mal union is the effect of body weight carried too early by newly-united bone. The time required for complete consolidation of bone is much longer than is usually thought, as is shown on the refracture of mal-united femurs by manipulation from two to four months old. Another cause of mal-union is impatience on the part of the surgeon. At the end of the fifth week he tests the fracture and finds it ununited; if left alone for another fortnight or more, consolidation would be secured, instead of which, an examination is made two or three times a week, and the chance of the bone uniting is diminished. It must be remembered that a small percentage of fractures require twice as long to consolidate as do the rest. A good method of fostering union is that introduced by H. O. Thomas, i.e., damming and percussion. With a heavy, well-covered mallet, the fracture ends are beaten, and an indiarubber tube is tied 2 in. or 3 in. above and also below the fracture. The most obstinate of all ununited fractures is that which occurs in the tibiæ of small children. They seem to resist any wire or plating, and prove a veritable nightmare to the surgeon. In two cases Jones secured firm union by transplanting a portion of the other tibia between and over the fractured ends.

If we have to operate upon an ununited and mal-united limb, preliminary traction is very valuable (*Plate XVI, Fig. D*). An old overlapping fracture of tibia and fibula, after traction by a pulley, followed by extension for a week, may be fixed by plate and screws in much better position, with less loss of bone than if operated upon at once. Powerful traction is not applied to the best advantage in the case of a large wound. If an operation is performed, the fragments should be securely fixed with plates and screws; if comminuted, all splintered pieces of bone should be placed in position.

The failures shown in the report in fractures of the neck *of the femur*, Jones says are startling: excluding the patients under 26 years of age, there were only 33 per cent of good functional results. The Liston splint and the weight and pulley should be discarded. To avoid and minimize deformity and obtain a useful limb, it is essential to treat the limb in the abducted position. The mode of reduction is simple. A roller towel is placed round the patient's perineum for counter-extension, while manual traction is applied to the limb, and continued until the correct length of limb is obtained; the limb is rotated inwards until the foot is at right angles to the table, and slowly abducted under tension. The abduction relieves the muscles which obstruct reduction and brings the outer fragment on to the inner. This position can be maintained by plaster-of-Paris bandage, but better still by an abduction frame (*Plate XVI, Fig. A*). As regards the impaction of fragments, if there be hardly any shortening and no eversion, it should be left alone; if there be eversion and shortening, it should be reduced at once. In six weeks, a Thomas's knee-splint is applied with extensions (*Fig. C*). In old people where there is fear of hypostatic pneumonia, this can be applied from the first, and the patient may be well propped up. The poor results in the report are due, Jones thinks, firstly to insufficient reduction of the deformity or to no attempt

PLATE XVI.

FRACTURE OF THE NECK OF THE FEMUR.

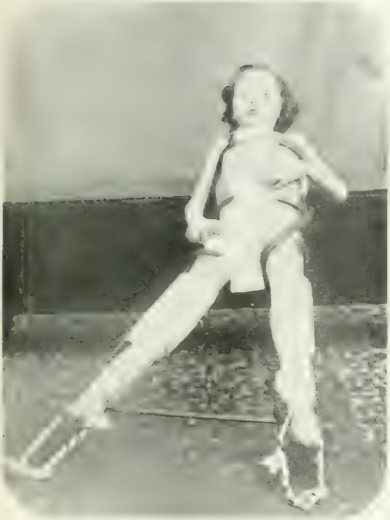


Fig. A.—A [illegible] showing [illegible] traction and counter-extension.

Fig. B.—Walking-caliper.

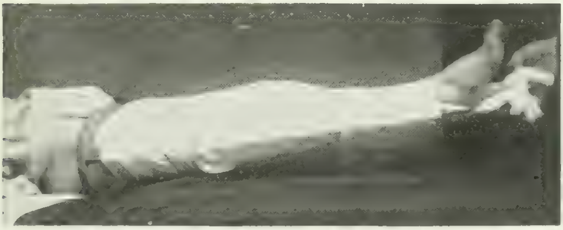


Fig. C.—Thomas's knee-splint for fractured femur.

Fig. D.—[illegible]

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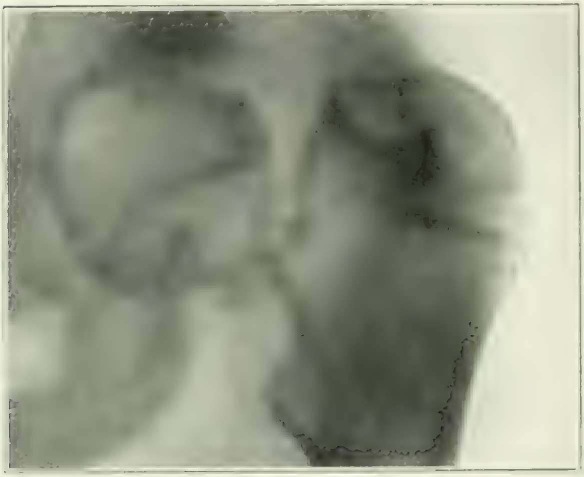
PLATE XVII.

FRACTURE OF THE NECK OF THE FEMUR



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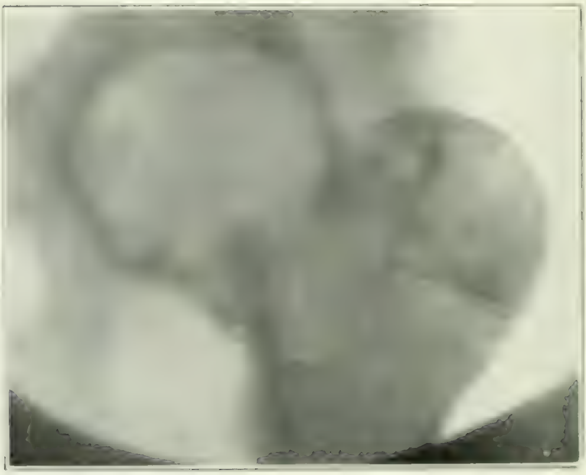


[illegible]

at fixation, and secondly to too early attempts at walking. When the patient begins to walk he had better wear a walking caliper splint (*Fig. B*). *Plate XVII* shows (*Fig. A*) fracture, and (*Fig. B*) restoration of contour, of the neck of the femur.

Why is the treatment of *fractures of the femoral shaft* in the adult so much less satisfactory than in the child? Jones asks, on reading the Committee's results. He personally treats most cases with a Thomas's knee-splint, and he says the great advantages of this splint are overlooked by prominent surgeons in this country. Obstetric fracture in the new born is best treated by a small Thomas's bed-splint. In certain fractures of the upper third of the femur, when a marked deflection of the upper fragment occurs the abduction frame may be advantageously employed. At the end of six weeks the patient gets up and walks about in a walking caliper. The cause of the bad results in fracture of the femur, Jones ascribes, not to the way the fracture was set in the first instance, but to the fact that owing to the pulley and extension treatment, the thigh muscles contract every time the patient moves, and over-riding and shortening occur.

As to *fractures of leg bones*, in those of the tibia alone the results are fairly good; they are not so good when both bones are broken, and the results in cases of Pott's fracture are very bad, and compare unfavourably with those given by Bardenheuer in the Appendix, and those of Hitzrot in the *Annals of Surgery*. A Pott's fracture should be reduced at the very earliest opportunity, in spite of swelling or effusion; the consequences of delay are serious. To reduce the fracture, the knee should be well bent, and it may be useful at first to increase the deformity in order to disentangle the ends. With the foot somewhat flexed, the surgeon should pull the heel forwards and push the tibia backwards until he feels that the dislocation of the ankle is amended. He should then direct all the force that is needed to over-correct the valgus slightly. Unless there is a splint fracture of the posterior portion of the tibia, there is but little tendency to subsequent displacement. Ultimate deformity is due either to insufficient reduction, or to a giving way of the ankle due to deflection of weight upon the yielding bone. This may be corrected if recent by wrenching; if the union is too firm, osteotomy may be needed.

In Pott's fracture, a boot should be worn with the inner side raised, and in some cases with an outside iron.

In the upper limbs the thing most worthy of notice is that at the elbow the results of both operative and non-operative treatment give over 40 per cent of failures. Jones recommends treatment in the hyperflexed and supinated position; no change should be made in this position for two weeks, and then the only change is a lowering of the wrist for an inch or so. Early movement, even passive, is a great mistake in these cases. Operative results on the growing epiphysis are worse than in those not operated on. In fracture of the olecranon the results of operative and non-operative treatment are nearly the same. The results in fracture of both bones of the forearm in children are less satisfactory than they should be. It is a wise precaution for those with no great experience in treating fractures, to keep the forearm well supinated. The results in Colles's fracture are very poor, only 57 per cent giving good functional results; the radial deformity should be corrected completely, but the ulnar prominence is of little importance; massage should begin at the end of the third week.

No surgeon can read the report of the Committee, and Mr. Jones's criticisms, without being convinced that a part at any rate of the bad results is due to inefficient treatment, and if suitable non-operative treatment were applied in the first instance, the results would be better.

Pirie Watson[3] reports the results in over 400 *simple fractures treated by massage and movement.* The younger the patient, the less massage is required; young tissues are exceedingly susceptible to massage and react to it quickly. He has used a powder consisting of equal parts of talc and boric acid as the lubricant; Lucas-Championnière prefers olive oil. Massage is begun at once; the sittings should not exceed fifteen minutes, and twenty-four hours should elapse between them; after the first nine or ten days they may be at less frequent intervals. Passive and active movements are also used, passive first and the active later. They are especially necessary in fractures near joints. Full amplitude is not necessary to prevent adhesion, and the production of pain should be avoided. In contradistinction to some surgeons he does not believe immediate reduction of a fracture to be necessary, and states that in some cases this may be postponed with advantage, since after massage it may become much easier to effect reduction. In Colles's fracture, contrary to Jones's procedure, reduction was not attempted unless the displacement was gross; if reduction were not performed, impaction was carefully preserved, and Watson states that practically complete restoration of function was obtained in four weeks. Fractures of the elbow and of the condyles of the humerus were treated in the flexed position, but passive movements were commenced, being limited to pronation and supination; flexion and extension are only allowed when consolidation has occurred.

OPERATIVE TREATMENT OF FRACTURES

Walker[4] reports 21 cases of fracture of the femur where he used Lane's plates after the best efforts of conservative treatment had failed. He never had a break of the plates, and follows Lane's technique. He draws attention to the fact that the plate only approximates the fragments and is not sufficient to hold them. He uses the [illegible] apparatus and puts a plaster case on the limb, allowing this to dry before taking off the extension or removing the patient from the table. He [illegible] the X-rays will indicate the cases in which operation is necessary.

[illegible] of Boston, has used Lane's plates in [illegible] cases of recent broken bones. He has traced the history of 18, [illegible] which were simple and [illegible] compound; of these latter, 14 were healed by granulation, which

4 were suppurating at the time of operation. Of these 38 patients, 13 are known to have had their plates removed, 4 in simple fracture cases and 9 in compound; 7 of the results Bartlett considered to be failures. The mortality has been 3·0 per cent. In future he will abstain from general anæsthetics when a functional result merely is contemplated in a chronic alcoholic, and forego bone-work until primary shock is past. He is now operating on a smaller percentage of fractures than he did at first.

Sweet and Winsor[6] have carried out some experiments in dogs on the various methods of operating on fractures. They used two intramedullary and two extramedullary methods, bone dowels or pins, and silver tube dowels, Lane plates both of steel and steel silver-plated, and a steel plate fastened with a special bolt and nut. Their work is not yet finished, but the following points are worth noting: Infection vitiates the result of any method; no method in the dog can prevent mobility without external splinting, and mobility is harmful; a constant stress such as might be exerted on a screw by a constant muscle-pull or by the weight of the limb, will result in a pressure necrosis of the bone round the screw. As a deduction from this, they suggest that every operated fracture should be treated after plating exactly as though it had not been operated upon. The use of silver is not recommended, as it has action on the tissues. Certain considerations favour the bone dowel, but it is difficult to apply tightly on both fragments, and if it is not tight it will become a foreign body in the medullary canal, making more trouble than any other device.

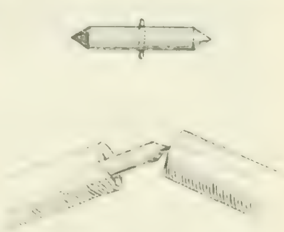


Fig. 20.—Hey Groves' pegs with fixed cross-pieces. The lower figure shows the method of inserting in position.

Eliason[7] experimented with various steel plates and screws, and came to the conclusion that a G vanadium plate with re-enforced screw eyes accommodating four No. 6 screws one half-inch long threaded to the head in a No. 32 drill hole, gave the strongest union.

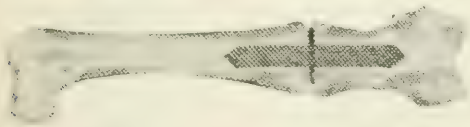


Fig. 21.—Femur of a cat six weeks after operation, showing steel peg in position. The bony union is quite firm. *Drawn from a skiagram.*

Hey Groves[8] has made experiments with intramedullary pegs, and has also used them clinically. He has employed pegs with a fixed cross piece (*Figs.* 20, 21), which prevents the peg slipping into the medullary cavity. The method of use is shown in the diagrams, but it can only be applied to those cases where the broken bone fragments are easily separated from one another, and owing to its shortness, it does not exercise much influence in maintaining the straight axis of the bone. These pegs are 2·4 cm. in length. In the majority of fractures that require operation, the ends cannot be separated and these pegs cannot be used; he has therefore devised a longer peg 4·7 cm. long (*Fig.* 22), perforated in its centre by a hole transverse to its long axis; along opposite sides of the peg run grooves in its whole length, and into these grooves the transverse hole opens. A fine flexible steel wire is threaded through the hole, and lies snugly in the grooves, so that the whole peg can be slipped into one fragment of the bone; the other fragment is brought into apposition, and then by traction on the wire, the peg is pulled into position, so that one half lies in one fragment and the other half in the other. The sizes of the pegs vary from ¼ to ½ in. in diameter, and a drill is used to make a hole in the bone to fit the pegs. He got a very good result in a fracture of the upper third of the thigh, where Lane's plates are difficult to fix. He has also used metal pegs of steel and magnesium. The latter leads to overproduction of callus.

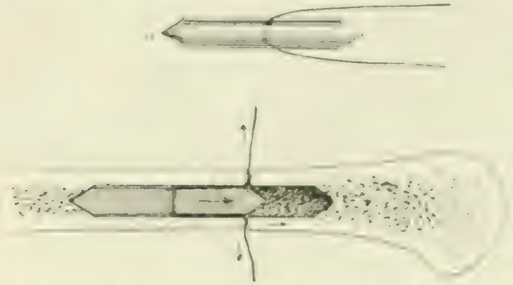


Fig. 22.—(a) Longer peg, 4·7 cm., grooved on the outside along the wire running its length. (b) Peg is partially ready for pushing into the right-hand fragment.

Roberts[9] thinks that operative fixation of fractures of the femur is not so innocuous a proceeding as some medical men seem willing to assume, and quotes cases to show that plating may be a cause of delay in union of the fractured bones. He records an apposite case, and quotes the opinions of other surgeons on this matter; and even many of those in favour of operative treatment admit that union is delayed, contrary to the opinion of Lane. He says that operative treatment is particularly dangerous when adopted by novices in aseptic surgery or in places where complete asepsis cannot be obtained.

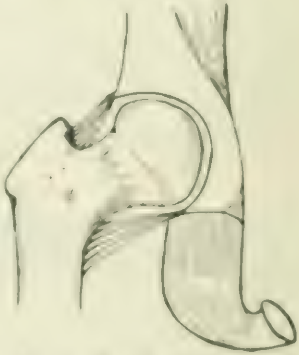


Fig. 23.—[illegible] of the neck of the bone.

Fracture of Neck of Femur.—Royal Whitman[10] again draws attention to the *abduction treatment*. This method seems to have been neglected in England, and Jones of Liverpool (*vide supra*) is the only surgeon who gives it much consideration. The method is a sound one, based on anatomical and pathological grounds, and gives good results. Perhaps one reason why it has been neglected is that the text books and surgical tradition have been in favour of the view that much cannot be done for this fracture. This is a mistake, and Whitman's method should be tried before attempts are made at any operative treatment. The results of the latter have not been so good as some of its advocates make out, and the risks are certainly greater. The anatomical basis of the treatment is this: the normal inclination of the neck of the femur of about 130° permits a range of abduction at the hip of about 40° to 50° (*Fig.* 23). During the movement of abduction the head of the femur glides downwards until the lower third emerges from the acetabulum and distends the lower part of the capsule (*Fig.* 24). At the limit of abduction under anæsthesia, the base of the neck is in contact with the rim of the acetabulum, the tissues covering the trochanter are apposed to the tissues covering the pelvis, and the capsule is tense. Any change from the normal, either in the forward, backward, or upward inclination of the femoral neck must induce a corresponding change in function; e.g., shortening of the neck, or loss of its normal angle, would limit the range of abduction, and this is always present after fracture of the neck of the femur treated in the conventional manner, even when union has been obtained.

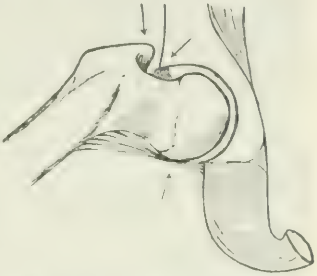


Fig. 24.—Illustrating the three checks to abduction: Tension on the capsule; contact of the neck and acetabulum; and contact of the trochanter and pelvis.

In complete fracture of the neck of the femur the limb is usually shortened, somewhat flexed, rotated outwards and often slightly abducted (*Fig.* 25). Thus, the outer fragment is turned forwards, displaced upwards, and usually lies on a lower plane than the head. As one has no control over the inner fragment, contact can be assured only by adjusting the outer fragment to it (*Figs.* 26, 27). This is accomplished as follows: The patient, having been anæsthetized, is lifted on to a sacral support, the shoulders resting on a box of equal height, while the extended limbs are supported by two assistants. The assistant holding the sound limb then abducts it to the anatomical limit to illustrate the normal range, which varies in different individuals and at different ages, and incidentally to fix the pelvis by direct bony contact. The operator first flexes the thigh to disengage the fragments;

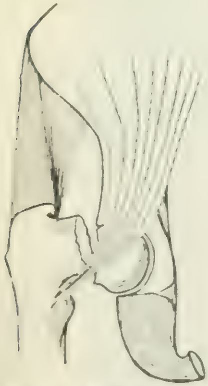


Fig. 25.—Complete fracture, and the effect of muscular contraction in increasing the deformity.

the assistant then extends the limb, and by manual traction overcomes the shortening as demonstrated by the relation of the trochanter to Nélaton's line and by measurement; he then rotates it inwards, and under traction abducts it to the normal limit, the operator meanwhile lifting the thigh from beneath. Inspection should now show absolute correspondence between the extended limbs as to abduction, rotation, length and position of the trochanters. In this position the limb is fixed by a plaster spica extending from the nipples to the toes (*Plate XVIII, Fig. 3*).

[illegible]

True impaction of this fracture must be infrequent, and could only be caused by direct violence. What passes for impaction is usually a fracture with but slight displacement (*Fig.* 28); clinically, a case in which shortening is slight, crepitus absent, and in which some control of motion or even capacity for weight-bearing is retained. These cases may be treated in the same manner. Another type of so-called impaction is the incomplete fracture, the neck being depressed by the opening of a wedge-shaped interval in its upper border (*Fig.* 29); this is most common in childhood, but it is by no means limited to early life. Such and similar deformities may be corrected as follows. As normal abduction depends upon the upward inclination of the neck, it must be limited in direct proportion to the lowered or lost angle. Thus the range of abduction under anæsthesia is checked by contact of the neck with the upper border of the acetabulum, a contact that fixes it; now, under steady traction aided by downward pressure on the projecting trochanter, the limb is still further abducted, with the aim of overcoming or lessening the deformity. In other words, the deformed neck lies in a plane

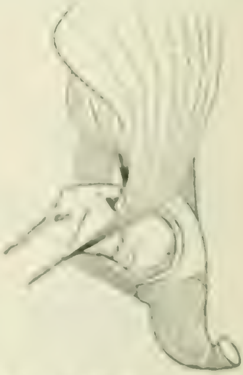


Fig. 29.—[illegible]

WHITMAN'S METHOD OF TREATING FRACTURE OF THE NECK OF THE FEMUR

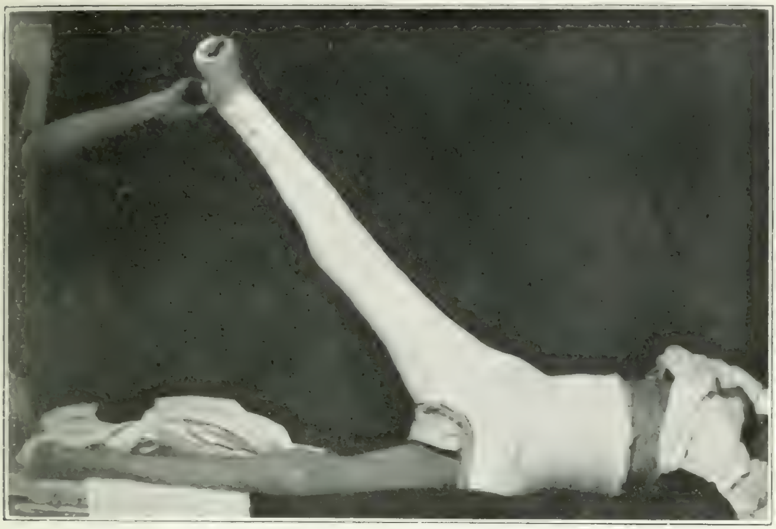


Fig. A.—Plaster spica, showing attachment to the pelvis.

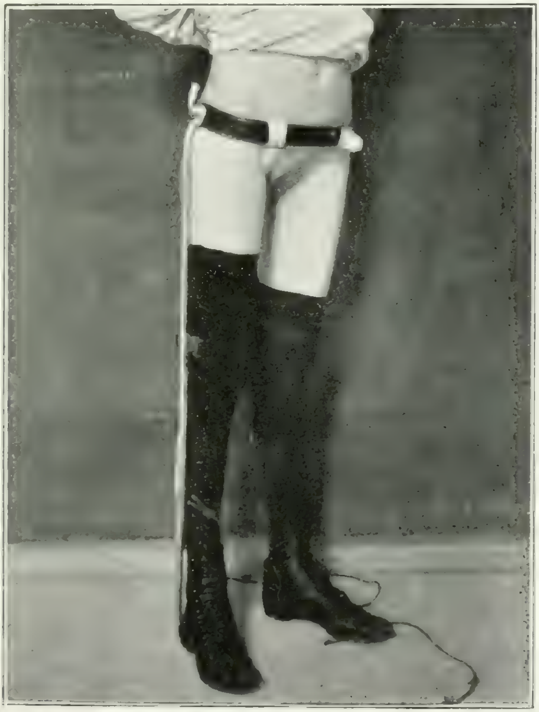


Fig. B.—Hip splint to permit walking without weight-bearing used during period of convalescence.

representing normal abduction, while the shaft is in the middle line. The shaft is therefore abducted until the normal relation is restored, at least to the degree that is practicable. When this is accomplished, the outward rotation having been reduced, a plaster spica is immediately applied (*Plate XVIII, Fig. A*). In the classical but unusual cases of true impaction in which the neck is shortened, corrective manipulation may not be indicated.

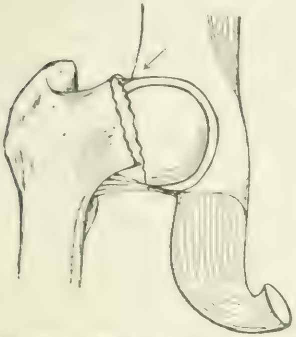


Fig. [illegible].—A form of complete fracture, [illegible] mity may be easily corrected by traction and abduction.

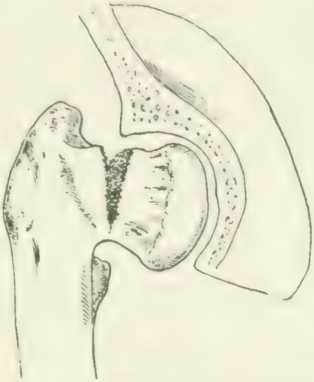


Fig. [illegible].—A form of incomplete fracture, with deformity which may be easily corrected by the abduction method.

This injury is not uncommon *in early life*, but is rarely seen by writers on fractures because the patients are not sent to hospitals. In general there are two classes of fractures (*a*) that of the neck, (*b*) that at the epiphyseal junction. The first is very similar to that seen in adult life, except that it is often incomplete, and that, if untreated, union with deformity (coxa vara) is the rule. The epiphyseal variety is limited to adolescence, and although it is not uncommon in normal subjects as the result of direct violence, a large proportion of the patients are of the weak, rapidly-growing, or over-weighted type. The injury is usually slight, causing an infracture rather than a separation. The patient usually walks about complaining of stiffness and limp, the deformity of the bone gradually increasing until, after further injury or overstrain,

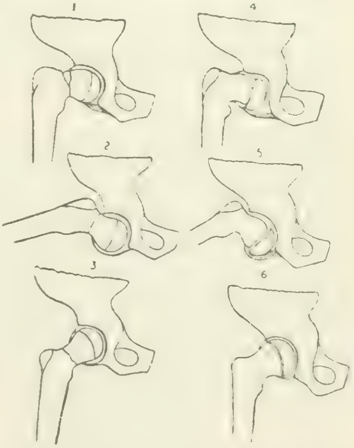


Fig. 30.—Diagrams illustrating Whitman's abduction method of reducing deformity of the fracture of the neck and at the epiphyseal [illegible], which appeared in the [illegible] November, [illegible].

the disability may become complete. The majority of cases now classified as unilateral coxa vara are of this type. In the treatment of both types the abduction method is essential. In the epiphyseal form, the manipulation of flexion, abduction, and inward rotation must be forcible and persistent, and if the case is of long standing with forward and upward displacement of the neck in relation to the head, an open operation is required to appose the fragments properly (*Fig.* 31). The plaster is kept on eight to twelve weeks, or even longer. Crutches are used when the patient has regained sufficient strength and confidence to make locomotion safe. Weight-bearing must not be permitted until sufficient time has elapsed to ensure firm union, confirmed if possible by *x*-ray pictures. (*See Plate XVIII, Fig. B.*) The open operation is rarely indicated primarily, except in the epiphyseal type of fracture in which the fragments are displaced and adherent. It is indicated for non-union in suitable cases. The joint is opened by an anterior incision from the anterior superior spine to the base of the neck. The fragments are freshened apposed, and fixed in contact for a sufficient time by a drill passed through the shaft and neck, and into the head. In cases of long standing in which union is impossible the head should be removed and the trochanter implanted and fixed in the acetabulum to assure the capacity for weight-bearing at the expense of movement.

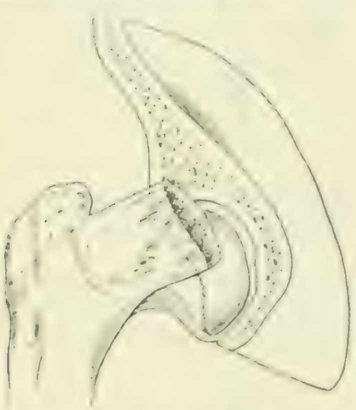


Fig. 31.—Epiphyseal fracture with displacement, in which the open operation is indicated.

Worms and Hamant[11] review very thoroughly the fractures of the neck of the femur in childhood and adolescence. Before the introduction of the *x*-rays this fracture was not believed to exist in childhood and adolescence except as an epiphyseal separation. The authors consider that at the present time the existence of these fractures must be admitted. They have made some experiments on the dead bodies of children from one to fifteen years of age, and they say that fracture is as frequent as separation of the epiphysis. They come to the conclusion that the fractures may be complete or incomplete, and may terminate in union with good function, union in a faulty position, or non-union; and that traumatic coxa vara is one result of such fractures.

Fractures about the Wrist.—Knox and Salmond[12] have analysed the radiographic findings in [illegible] cases of injuries to the bones of the wrist. These were divided into two classes: (a) those in which the lower epiphyses of the radius and ulna have joined their shafts; and (b) those in which they have not yet joined. [illegible] cases belonging to the first series and 94 to the second. The first corresponds roughly with persons above the age of twenty, and the second with persons below that age. From an analysis it appears that the most common injury at the wrist in the first series of cases is a transverse fracture one half-inch above the lower end of the radius, the lower fragment being displaced backwards, and with or without a fracture of the styloid process of the ulna; in cases of the second series, where the epiphyses are not yet united, the commonest injury is a transverse fracture about one inch above the lower ends of both forearm bones and with both lower fragments displaced backwards.

Campbell[13] reports three cases of fracture of the carpal scaphoid with involvement of the median nerve. In two of the cases the fracture was caused by sudden over-extension of the wrist, and it was thought that the median nerve had been overstretched; probably also one of the fragments was pressing on the nerve.

Wallace[14] has investigated the injuries caused by hyperextension of the wrist and "back fire" when starting a motor car. The conclusion he comes to are that the following injuries may result: fracture of the scaphoid, dislocation of the semi-lunar, backward dislocation of the os magnum, the unciform, and the os pyramidale, and transverse and vertical fractures of the radius.

Fracture of the Ulna with Dislocation of the Head of the Radius.—Ashhurst,[15] of Philadelphia, says this combined injury is not so rare as is believed; often the luxation of the radius is overlooked though the fracture of the ulna is usually recognized. In every fracture of the ulna, dislocation of the radius should be looked for, and *vice versa*. In 140 instances of this combined injury there were 15 examples of nerve injury; in 2 of these, musculospiral paralysis appeared to have developed immediately after the injury; in most cases, however, it seems to have arisen later, being due to a secondary neuritis from pressure on the nerve in stretching over the displaced radial head. Immediate reduction is therefore necessary and if this be obtained, the ulna fracture as a rule will heal in good position without further trouble; if reduction be not obtained, the ulnar fragments will overlap or angulate, and union with deformity, or non-union, will result.

In recent cases with irreducible luxation, the surgeon should resort to arthrotomy if reduction is impossible by manipulation, the object being to remove the torn capsule from its obstructing position in front of the capitellum of the humerus and from over the lesser sigmoid cavity of the ulna, and to suture it round the head of the radius. In adults, if irreducible, the head of the radius should be excised, as if left it is very apt to lead to dystrophic arthritis.

Of old cases with unreduced luxation he collected twenty-seven. The treatment is to reduce with arthrotomy if possible; if this is impossible, as it may be if the ulna has united in a bad position, the head of the radius should be excised, unless the deformity in the ulna is extreme, when osteotomy of the latter bone may be done. In old cases with non-union of the ulna, the ulnar fracture should be exposed first, and, after freeing the fragments; reduction of the dislocation secured (by arthrotomy if necessary, including capsulorrhaphy); the ulna fracture being then treated as if no dislocation had existed.

Kirmisson,[16] in an article on this lesion, says that the fracture is nothing, but the luxation is everything. He thinks that the riding of the fragments of the ulna is due to the shortening of the forearm from the dislocation upwards of the radius, and if this is reduced the fracture of the ulna is easily replaced. In children, if the ulna has united in good position and the movements are good, the radius should be left alone. Abadie[17] believes that the dislocation of the radius is not the obstacle to reduction of the fracture, but the dentated ends and overriding of the ulnar fragments.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, ii, 1505; [2]*Ibid.* 1560; [3]*Edin. Med. Jour.* 1912, ii, 315; [4]*Ann. Surg.* 1912, ii, 847; [5]*Bost. Med. and Surg. Jour.* 1913, i, 149; [6]*Ther. Gaz.* 1913, 396; [7]*Ibid.* 313; [8]*Brit. Med. Jour.* 1912, ii, 1102; [9]*Ann. Surg.* 1913, i, 541; [10]*Lancet*, 1913, i, 1548; [11]*Rev. de Chir.* 1912, ii, 318; [12]*Lancet*, 1912, ii, 1213; [13]*Ibid.* 1390; [14]*Ibid.* 1913, i, 1600; [15]*Ann. Surg.* 1912, ii, 641; [16]*Presse Méd.* 1912, 229, and 1913, 281; [17]*Ibid.* 1913, 49.

FURUNCULOSIS. (See also SKIN, GENERAL THERAPEUTICS OF.)

E. Graham Little, M.D., F.R.C.P.

J. and R. J. Reynolds[1] recommend the administration of **Acid. Sulph. Dil.** (**B.P.**) in 20- to 30-min. doses, diluted with 2 oz. of water, every four hours, in the treatment of carbuncle and boils, the only external dressing used being carbolized vaseline. Stephens[2] claims that **Colloid Mercury** (a fine suspension of metallic mercury in water, produced by electrolysis) applied locally to septic areas, like boils and carbuncles, brings about an immediate cessation of the inflammation. The part to be treated must first be cleansed with ether or chloroform.

REFERENCES.—[1]*Lancet*, 1913, i, 741; [2]*Brit. Med. Jour.* 1913, i, [illegible].

GANGRENE COMPLICATING GENERAL INFECTIONS.

Herbert French, M.D., F.R.C.P.

Gangrene of the fingers is not common; the simplest examples are seen in Raynaud's disease and in syringomyelia. An altogether different type has been described recently, however, as a complication of pneumonia and other infective processes. Two examples are given in detail by Harttung[1] under the title of spontaneous symmetrical dry gangrene of the index fingers. Both occurred as a complication of acute inflammatory processes in the lungs, and arteriosclerosis could be excluded. The symmetry of the gangrene suggested that it was the result of toxins acting through the vasomotor nerves.

REFERENCE.—[1]*Berl. klin. Woch.* 1913, [illegible].

GANGRENE, SURGERY OF. (See also DIABETES MELLITUS.)

[illegible], M.D., F.R.C.S.

[illegible][1] of New York, gives a résumé of the literature of emphysematous gangrene, and reports twenty-five new cases. Many names have been given it, and he prefers to call it gas bacillus infection, as it is due to infection with *B. aerogenes capsulatus*. He considers that the cases reported as due to the *vibrion septique* will be proved to be identical. It occurs most commonly in wounds where great trauma has been exercised, e.g., compound fractures, extensive lacerations, crushes, and grinding accidents; three cases resulted from the bite of animals, several from obstetric cases and operations around the perineum, a few from subcutaneous injections, and one from tooth extraction. In the group of 25 cases collected at Belle Vue Hospital, *B. aerogenes capsulatus* was found in 15; it was not searched for in the others. The gross mortality was 44 per cent. Eight of the 25 cases, of which 5 were of a pronounced type, were treated by incisions and continuous irrigation or baths, with no deaths; 5 were treated by free incisions and peroxide of hydrogen continuously administered locally. Pus is seldom present, and the commencement is very insidious. The incubation is short. The disease may be divided into superficial and deep types. The latter requires prompt and energetic action; oxygen, preferably in the form of hydrogen peroxide, should be used, but not in full strength or in confined spaces, or injected directly into the tissues. The incisions should be free, and if amputation has to be performed, spinal anæsthesia should be employed in place of general anæsthesia. Early recognition is the key-note of success in combating the condition; smears should be made from the original wound, and not from some point distant from it, as the bacillus is often only found near the former.

Amputation in Gangrene of the Extremities.—Ehrlich and Maresch[2] give the results of a study of 81 cases of gangrene in von Eiselsberg's clinic in Vienna. Of these cases, 44 were the result of arteriosclerosis and 20 were due to diabetes. In cases of gangrene of the foot due to arteriosclerosis, if the general condition is good, separation of the toe may be waited for; exarticulation in the neighbourhood of the foot is not to be recommended. If a line of demarcation does not form, or the gangrene spreads, or septic complications ensue, or unbearable pain is present, amputation in the thigh should be performed in old people. In younger people, in some cases amputation of the leg may give good results if the popliteal pulse is present and the stump bleeds freely. In diabetics, if amputation is done it must be in the thigh. In all other forms, if there is no diffuse or progressive gangrene, e.g., after burns, wounds, or frostbites, it is best to wait in young people for a line of demarcation to form, unless septic processes compel an early interference.

REFERENCES.—[1]*Ann. Surg.* 1912, ii, 544; [2]*Wien. klin. Woch.* 1913, 1058.

GASTRIC ULCER. (*See also* STOMACH AND DUODENUM, SURGERY OF.)

Robert Hutchison, M.D., F.R.C.P.

PATHOLOGY.—Bolton,[1] as the result of his further researches into the mode of origin of chronic ulcer of the stomach, is persuaded that chronic ulcer arises always by the extension of an unhealed acute ulcer. "The funnel shape of an ulcer is not due to the fact that it arises as a result of vascular occlusion; it is merely the result of the mode of spread of the ulcer, which occurs in two directions, laterally and in the depth. If lateral extension has occurred rapidly, the funnel is a very shallow one, and this shape disappears when the muscular coat is destroyed, the ulcer assuming a flattened form. If extension has occurred chiefly in the depth, the funnel shape is well marked and perforation soon occurs, unless there is a well-marked inflammatory reaction and thickening. Digestion of the sides of the ulcer undermines the edges, so that the flat variety acquires a raised and overhanging edge, and the funnel-shaped ulcer is converted into a globular or other irregular-shaped cavity.

"Chronic ulcer probably always arises in this manner, because so far as we know at present, every initial lesion leading to ulcer is essentially acute and produces in the first instance acute ulcer. According to the nature of this initial lesion there are several different types of acute ulcer. They are all, under suitable circumstances very little understood at present, able to spread and become chronic, but there is undoubtedly one particular type of acute ulcer which most frequently undergoes these changes.

"Acute ulcer, whatever its origin, tends to heal rapidly and completely within a few weeks, and perhaps there is one type which most commonly does this. Occasionally, without showing any tendency to spread, an acute ulcer may be delayed or arrested in its healing, when thickening occurs and the condition may become chronic."

Friedenwald,[2] from a statistical study of 1000 cases of gastric carcinoma, is unable to agree with the sweeping statements that have been made as to the frequency with which ulcer becomes transformed into cancer. He considers that this does not take place in more, and probably in less, than 23 per cent of cases of ulcer.

SYMPTOMATOLOGY.—Smithies[3] has studied the symptoms in [illegible] cases of gastric ulcer without complications which were all demonstrated at operation. He finds that in more than one-third of such cases, the stomach's emptying power is maintained. Of this group of ulcers 92 per cent occur between the ages of thirty and sixty. Males aro affected three times as frequently as females. Nearly three-fourths of the cases have "spells" or "attacks" of discomfort, with good health between. Such a history may extend over thirty years without alarming clinical manifestations. The attacks are usually called "biliousness" or "dyspepsia." They often show a peculiar seasonal relation. In 36 per cent, the disability is continuous, with or without nutritional disturbances.

Epigastric pain or distress is a constant symptom. It is "colicky" in nature in more than [illegible] per cent of cases, requiring hypodermic medication in [illegible] per cent. It is frequently mistaken for appendix or gall-bladder disease, and is often associated with such in addition to gastric ulcer. Night pain, with interference with sleep, is present in [illegible] per cent of cases. Eighty per cent of patients complain of epigastric distress, frequently referred to the right rib margin or the back. In 87·8 per cent of proved ulcers, pain or distress has definite relation to food ingestion. Eighty-three per cent of cases show pain or distress coming on within four hours following eating. Nearly two-thirds of pyloric ulcer cases have discomfort from two to four hours after eating, more than one-half of lesser curvature ulcers from one to three hours after, more than two-thirds of posterior wall ulcers within three hours after, and more than two thirds of ulcers near the cardia, less than two hours after eating, while in more than 44 per cent of this class it is less than one hour after. Discomfort is most frequently controlled by ingestion of food and alkalies, and by vomiting. 12·2 per cent required morphine.

On *palpation*, epigastric tenderness is exhibited in 95 per cent of cases. In more than three-fourths, tenderness was most marked in the right upper abdominal quadrant. 2·8 per cent of cases showed palpable ridges. More than four-fifths of the ulcers were located at the pyloric half of the stomach, and this was in general the anatomical area of greatest complaint or distress on examination. The diagnosis of the character of ulcer to be found on exploration is only possible where a careful anamnesis is made.

Vomiting is present in nearly three-fourths of gastric ulcers without food retention. About 17 per cent vomit food. Only rarely is delayed vomiting observed. Vomiting is induced in more than 10 per cent of cases to relieve pain. Nearly 40 per cent of patients vomit regularly. "Waterbrash" is a prominent feature in 19 per cent; pyrosis and eructation in 87·8 per cent. In nearly one-third of the cases, vomiting comes at the time of maximum abdominal distress. In 28 per cent the ingestion of food precipitates vomiting; more than 53 per cent vomit within three hours after eating. In 7 per cent night vomiting is a feature. Ulcers at the pyloric half of the stomach are most commonly associated with vomiting, even when there is no interference with the emptying power of the stomach.

Of 140 proved ulcers in this group, *bleeding* (hæmatemesis or melæna) was noted in but 40·7 per cent. About one-fourth of the cases had hæmatemesis alone, one-third hæmatemesis with or without melæna, while 7·1 per cent had melæna alone.

Test-meal Findings.—Irrespective of location of the ulcers, the average total acidity was 55; the average free HCl, 42·5; the "combined" HCl in 82 per cent of cases between 10 and 20. Total acidity is most commonly higher in ulcers involving the lesser curvature and anterior wall than where other parts of the stomach are affected. High free HCl is noticeably more frequent where the ulcer is at the pylorus. While high free HCl is usual in cases in the third decade of life, this is not the rule.

Operative Findings.—More than two-fifths of the ulcers were at the pylorus. Of 50 ulcers microscopically examined in this series, 24 per cent showed active inflammatory change, 12 per cent early carcinoma. In 35 per cent of cases, diseased appendix was associated with gastric ulcer. In 15 per cent, cholecystitis and cholelithiasis were demonstrated as concomitant processes. In nearly two-thirds of the group of gastric ulcers, diseased appendix and gall-bladder were revealed. In view of these figures it is evident that all laparotomies should be thoroughly exploratory, even when a well-marked gastric ulcer has been demonstrated.

DIAGNOSIS.—Friedenwald and Baetjer[4] believe that they are justified in drawing the following conclusions from their study of the x-ray *diagnosis* of gastric and duodenal ulcer. It offers most valuable assistance as an aid in the diagnosis of peptic ulcer; and although not yet sufficiently well developed to be relied upon alone without entering into the clinical aspect of the disease, it is of the greatest diagnostic help in obscure cases. In duodenal ulcer there is an excessive hypermotility of the stomach, with rapid evacuation of the contents, so that the greater portion of the gastric contents is emptied within the first half-hour; there is hypermotility of the duodenum, with formation, usually, of a vacant area, which remains fixed in all the examinations.

The diagnosis of gastric ulcer can only be made in certain situations; that is, when the lesion is situated on the anterior surface of the stomach, and along the anterior surface of the lesser and greater curvature. In this condition there is an excessive irritation from the ulcer, with a consequent hypermotility and a spastic condition of the pylorus, so that for the time being there is practically no expulsion of the bismuth. It is only when the spasticity relaxes that a portion of the bismuth is expelled. In gastric ulcer, whatever its situation, we can always look for retention of contents. In certain instances there is a vacant area at the pylorus. There is frequently a tendency to hour-glass formation.

The x-ray affords an almost absolute means of differentiating between gastric and duodenal ulcer. By means of it the presence of a duodenal ulcer can be positively ruled out. The degree of healing of an ulcer can thus be more certainly determined than by any other way.

TREATMENT.—Prof. v. Bergmann[5] recommends highly a thorough course of **Atropine** (½ to 1 milligram in pill three daily) in the treatment of gastric ulcer. It promptly relieves pain and, he believes, favours the healing of the ulcer by abolishing muscular spasm. It also lessens the secretion of gastric juice.

REFERENCES.—[1]Canad. Jour. Med. and Surg. 1913, 497; *[2]Boston Med. and Surg. Jour.* 1913, i, 796; *[3]Amer. Jour. Med. Sci.* 1913, i, 491; *[4]Ibid.* ii, 480; *[5]Münch. med. Woch.* 1913, 169.

GENERAL PARALYSIS OF INSANE. (See SYPHILIS, TREATMENT OF.)

GLANDERS. *Leonard Rogers, M.D., F.R.C.P.*

A. Whitmore[1] has described under the name of *pseudo-glanders* a peculiar fatal disease of not uncommon occurrence in Rangoon, where he met with it in the post-mortem room, and at first thought it was true glanders, with numerous small patches of consolidation in the lungs. On making cultures and studying the bacillus obtained, it was found that it differed in important details from *B. mallei*, growing rapidly on peptone agar, producing early wrinkling on glycerin agar, a pellicle on broth, a tangled mass of long filamentous bacilli upon salted agar, while young cultures show an active serpentine motility. Animals can readily be infected by feeding experiments. In other cases the organism was recovered from the spleen and blood, showing it to be a septicæmia, while in a few cases the lung lesions were absent. The subjects were nearly all very poor, and addicted to injections of morphia or cocaine; most of the lesions were found in medico-legal subjects, so very little information regarding the clinical aspects of the disease are yet available. One case, however, occurred in the gaol under favourable sanitary conditions.

REFERENCE.—[1] *Brit. Med. Jour.* 1912, ii, 1306, and *Jour. of Hyg.* 1913.

GLANDULAR FEVER.

E. W. Goodall, M.D.

E. P. Baumann,[1] of Johannesburg, states that he has seen several cases of this disease, and that "it is a common disease, although not at all well recognized by the profession." He sums up the diagnosis of a well-advanced case as follows: "(1) Pyrexia; (2) Enlargement of the cervical and other lymphatic glands—at first unilateral and confined to the left anterior triangle; (3) Immobility of the head, with occasional slight dysphagia; (4) Enlargement of the liver and spleen; (5) Extreme debility and depression; and (6) Obstinate constipation."

REFERENCE.—[1] *S. Afr. Med. Rec.* 1913, 303.

GLAUCOMA.

A. Hugh Thompson, M.D.

Of all the newer operations for this condition, it would seem that the one that has most certainly come to stay is that of **Trephining the Sclero-corneal Limbus.** This method was sufficiently described in the MEDICAL ANNUAL, 1913. It will be sufficient now to add some further points drawn from the experience of Col. Elliot, of Madras, with whose name this operation will always be associated. The first trephining for glaucoma in Madras was performed in August, 1909; and so completely did it supplant all other operations in that clinic, that five years later, at the International Congress of 1913, Elliot was able to read a paper based on an experience of over 820 cases.[1] The trephining should, in most cases, he says, be performed in the upper quadrant of the eye. The conjunctival flap should be large. Its extremities should be at least 4 mm. from the limbus. "This is an important detail, for even if the line of incision should cicatrize down all round, filtering fluid from the interior of the eye can still find a free exit through the trephine hole into the subconjunctival tissue outside the incision limits through the areas left on each side." In the middle third of the wound, the subconjunctival tissue should be cleared down to the limbus with scissor points. As soon as the limbus is defined, the anterior layer of the cornea is split for 1 or 2 mm. by means of some sharp instrument (Elliot uses a Bowman's needle), great care being taken not to buttonhole the flap. Elliot's[2] reason for laying so much stress on this small variation of the technique is that he believes the point to be crucial.

One may, he says, and often can, trephine successfully outside the limbus; but if one desires to operate with an assurance of success, one must place the trephine hole as far forward as possible. Only thus can one be confident of a direct entry into the anterior chamber, unhampered by any adhesions which may be present between the iris base and the corneal periphery. It is advisable to lean slightly on the corneal edge of the trephine, so that, when that is cut through, the hinge which attaches the disc may be on the scleral side. This can be cut through with sharp-pointed iridectomy scissors.

A peripheral iridectomy must be performed in all cases, and as in most the iris prolapses into the trephine hole at once, it is recommended by Elliot to seize it, along with the disc, in one grasp of the forceps, and divide them with a single scissors cut. The iridectomy will be either a peripheral buttonhole or a complete iridectomy extending to the margin, according to the extent of the prolapse that takes place. As to the size of the trephine blade, after trying various sizes from 1 to 3·5 mm., at Madras a 2 mm. blade is used for all cases, a difficulty being found with any smaller opening in introducing an iris forceps to deal with an iris impacted in the wound, should this complication occur. Otherwise Elliot[3] recommends a trephine with a diameter of 1·5 mm. as the most useful size. Before replacing the flap, the eye should be inspected, to make sure that the pupil is central in position, and that no tags of iris are caught in the trephine hole.

Immediately after operation no drops are used, but on the third day atropine is inserted. The reason for this practice is to guard against iritis, the one complication which is to be feared.

A recent paper by Stephenson[4] deals with some of the *causes of failure* after Elliot's sclero-corneal trephining. Septic infection is, of course, a danger common to all operations; but it is possible that some cases of late infection after trephining are due to the continued existence of a filtering cicatrix. Intra-ocular hæmorrhage, again, is a danger common to all operations for glaucoma, but seems less likely to occur during trephining than in any other of the operations commonly practised. According to Elliot, this is one of its advantages. Mechanical blocking of the trephine hole by iris, ciliary body, lens capsule, or lens itself, is undoubtedly the most frequent source of failure. The number of cases in which it occurs probably varies inversely with the expertness of the operating surgeon.

REFERENCES.—[1]*XVIIth Internat. Cong. Med.* 1913, Sect. ix, I, 371; [2]*Ophthalmoscope*, 1913, 324; [3]*Ibid.* 325; [4]*Ibid.* 540.

GOITRE, ENDEMIC.

Herbert French, M.D., F.R.C.P.

ETIOLOGY.—New light is being thrown upon the causation of endemic goitre and cretinism. The fact that both are specially related to districts where there are limestone rock formations remains, but there is a growing doubt as to drinking water being itself the causal factor. It is not the drinking water, nor any of its purely chemical ingredients, that produce the thyroid gland lesions, but the presence in the water of certain micro-organisms which seem to flourish better in limestone waters than in others. Nor do the bacteria occur in the water only; they are present in the soil as well; indeed, it appears likely that this is their primary source, and that they pass thence to the water and so to the persons who become affected. Adolf Kutschera[1] investigated the question fully in a goitrous district of the Austrian Alps. The distribution of the cases showed that the water supply was not a common factor, and yet that the cause was related to particular residence-places and their immediate neighbourhood.

That water can carry the infective agent under certain circumstances is, however, established; and the researches of McCarrison[2] in the Western Himalayan districts of Chitral and Gilgit, where goitre is endemic, common, and severe, show that a micro-organism is at the root of the mischief; that this micro-organism may reach man either direct from the soil, or indirectly by the vehicle of drinking-water; that it produces the goitre-forming toxins in the alimentary canal; that similar goitrous changes are produced experimentally in animals when bacteria are employed for the purpose; and that human beings suffering from these goitres are relieved, in some cases rapidly, by the use of a vaccine prepared from cultures of the bacilli.

It appears probable that goitrous enlargement of the thyroid gland may result, not from infection with one kind of micro-organism only, but from the effects of different micro-organisms in different countries. In support of this, McCarrison quotes the work of Carlos Chagas upon an acute epidemic form of thyroid inflammation that affects children in certain parts of Brazil; it has been termed "parasitic thyroiditis," and it is due to a trypanosome, the *Schizotrypanum cruzi*, possessing peculiar features, and is conveyed from man to man by a biting insect, the *Conorrhinus megistus*. According to Brumpt, other insects also can act as hosts, especially the bed-bug (*Cimex lectularius*), the excreta of which are highly infective. The malady, as the name implies, is essentially an acute condition; but if it does not terminate fatally within fifteen to thirty days of its onset, it lapses into a chronic form of illness, characterized by the presence of goitre, often of very large size, and symptoms due to partial or complete loss of function of the thyroid mechanism, nervous symptoms, and affections of the heart. It is not possible to distinguish such cases from cases of true "endemic goitre" by blood examination, since the trypanosome, which is said to cause the goitre, disappears from the blood-stream after the acute symptoms have subsided.

When, as in Gilgit, the endemic goitres are due to infection from the soil, by a micro-organism, directly or indirectly, the way is opened up towards the adoption of preventive measures. From McCarrison's very careful work we know enough to make it certain that good sanitation, cleanly houses, cleanly food, and the provision of water-supplies which are not fouled by the excreta of man and beast, are measures which promise an extermination of the disease.

Dieterle, Hirschfeld, and Klinger[3] show that goitre is due to residence in a particular district, and not to drinking its water, and their findings support McCarrison's theory of bacterial infection of the soil. Using rats as the experimental animals, they found that they developed goitre when they were kept in a goitrous district, and this no matter whether the water they were given was fresh or thoroughly boiled; similar rats kept in non-goitrous districts but given boiled water from goitre districts to drink did not develop goitre; other rats kept in the goitre districts, but given water from non-goitre districts, became goitrous. They conclude, therefore, that it is not the water, but something else (e.g., soil infection) in the affected regions that causes the inhabitants to be goitrous.

Howle[4] draws attention to the fact that there are parts of Australia in which goitre is endemic. He has investigated the drinking-water from the creeks in one district, and the fæces of both goitrous and of normal persons in the same district, and his results, so far as they go, entirely confirm McCarrison's discovery that the goitres are due to ingested micro-organisms. He did not employ vaccines in treatment, but the best results were obtained in many cases from the use of intestinal antiseptics. He used in particular **Thymol** 1 gr. to 3 gr. thrice daily in cachet or mixture, and **Urotropin** 3 to 10 gr. thrice daily in powder form.

SYMPTOMS.—Bauer[5] finds that a very large proportion of patients suffering from simple goitre have some functional disorder of the *heart*, generally taking the form of an accidental systolic bruit in the pulmonary area, or local to the cardiac impulse; accentuation of the pulmonary second sound; and slight increase of the cardiac dullness to the left. The impulse is not displaced or increased in force, the pulse-rate is not accelerated, and as a rule the patient has no subjective or objective symptoms to call attention to the heart.

REFERENCES.—[1]*Münch. med. Woch.* 1913, 993; [2]*Lancet*, 1913, i, 147, 219 and 363; [3]*Münch. med. Woch.* 1913, 1813; [4]*Austral. Med. Gaz.* 1913, 327; [5]*Deut. med. Woch.* 1912, 1969.

GOITRE, EXOPHTHALMIC. (*See also* THYROID, SURGERY OF.)

Herbert French, M.D., F.R.C.P.

ETIOLOGY.—Mori[1] records three very instructive cases in which symptoms of Graves' disease developed in consequence of secondary metastatic growths in the thyroid. In one the primary growth was a sarcoma of the pelvis; in the second, a melanotic sarcoma of the eye; and the third, a carcinoma of the breast. In all three the size of the secondary deposits in the thyroid gland was relatively small, and there were no papillary proliferations of the surrounding epithelial cells which are characteristic of ordinary cases of Graves' disease. Exactly how the symptoms resulted from the metastatic growths in the thyroid gland it is difficult to say, but the author's view was that the secretion of the follicles that were becoming compressed by the metastases escaped into the circulation in more than normal quantities, and so produced thyrotoxic symptoms.

SYMPTOMS.—There is a tendency to be afraid of diagnosing Graves' disease when there is no exophthalmos ; yet the latter symptom is very often absent. McKisack[2] records twenty-one cases, in all of which there was persistent tachycardia ; in most, there was fine tremor of the hands ; in many, slight, not obtrusive, but definite enlargement of the thyroid gland ; in none, exophthalmos ; all but three were women.

Treatment.—Musser[3] wonders whether the benefits that may sometimes follow operative treatment of exophthalmic goitre are to be attributed essentially to the gland excision, or whether they may not, in part at least, be due to the fact that an operation has been done ; he believes that almost any violence to the system may be followed by temporary or even permanent cure, and quotes cases in which Graves' disease, previously very severe, subsided after such serious intercurrent accidents as acute appendicitis or enucleation of the eye after trauma. He holds that many physicians omit to pay sufficient attention to all sorts of little details that may need careful supervision if the general health of their exophthalmic goitre cases is to be raised to its best—details which vary greatly according to the merits of different cases. He concludes that "surgical intervention should not be advised in cases of goitre associated with functional or organic disturbances of other secretory organs, until the associated disorders are removed or relieved. If relapse occurs in spite of general treatment, or in spite of treatment directed against the disorders of other organs, a goitre should then be treated surgically. Medical treatment should be continued from six to twenty-four months. Favourable results should not be promised unless the patient is under the absolute control of a physician, so that treatment by rest, diet, bathing, physical therapy, and so forth, may be carried out with precision and continuity. Surgical intervention requires the same rigid and prolonged after-treatment to give permanent results."

Schlesinger[1] adds his experiences to the question of whether cases of Graves' disease should be treated by operation or not. His views are based on twenty carefully watched cases. There was no death from the operation ; improvement resulted in many, but cure was effected in three only. Schlesinger is in favour of the operation of removing half the gland only, and ligaturing the superior thyroid artery on the other side. In regard to the indications, he advocates doing it when the patient, having had two months' careful medical treatment, has not already begun to show definite signs of relief.

Cohen[5] speaks strongly against the hasty or routine adoption of surgical treatment of exophthalmic goitre, and lays particular stress upon the fact that a very large number of cases recover without any special method of mechanical or personal treatment, even without prolonged rest, but especially if the patient can be kept at rest, with regulation of diet and under proper hygienic surroundings, for a sufficient time. He acknowledges that operation is sometimes, though not frequently, indicated ; the chief circumstances under which he would advise it being : (1) When the disorder has persisted for a long time.

and has advanced despite the best medicinal and hygienic management, including prolonged rest. (2) When the disorder is progressive, or far advanced, and is either disabling or dangerous, or threatens to become so—even though no sufficient attempt has been made at hygienic management, including rest. (3) When the patient's means or social status is such that rest is impracticable, and the disorder, although slight, is partially disabling, and has persisted for a year or more under treatment, with no sign of yielding.

He estimates that at least 70 per cent of all cases recover either spontaneously or under non-surgical treatment. He also discusses the difficulty of making any comparison between cases treated surgically and those treated non-surgically, because there is no standard by which one can determine what is meant by their recovery. Mere survival after operation is not recovery; and Cohen holds that Hale White is right in saying that most patients are at least as likely to be able to continue their ordinary duties in life with non-surgical as with surgical treatment. He devotes a large part of his paper to details of the therapeutic measures that may be adopted, including **Rest; Outdoor Air; Underdone Meat;** an abundance of **Hot Water** to drink; the limitation of carbohydrates; the use of **Baths; Massage** and manipulations; preparations of the **Ductless Glands**, particularly those derived from the thymus gland, the adrenal capsules, and the pituitary body; intestinal antiseptics, and drugs required for symptomatic treatment, amongst which he advocates particularly **Strontium Bromide, Ergot,** and **Picrotoxin**. He has found the various sera, antithyroidin and thyroidectin, disappointing in practice. The original paper should be consulted for a large amount of detail and for therapeutic suggestions.

The value of **Calcium Lactate** in controlling the paroxysms of *tetany after thyroidectomy* is recorded by Shepherd.[6] In one very severe case, after all other treatment, including the giving of parathyroid, failed, 60 gr. of calcium lactate were given every four hours, and after five doses the relief was remarkable. The patient disliked the medicine so much that it was discontinued, but she took it again when the paroxysms recurred, and again there was remarkable and rapid relief. Apparently it has to be continued, but there seems to be little doubt as to its real value.

REFERENCES.—[1]*Practit.* [illegible] 1913, [illegible]; [2]*Brit. Med. Jour.* 1913, i, 205; [3]*Amer. Jour. Med. Sci.* 1912, i, 810; [4]*[illegible] Week*, 1913, 37; [5]*Amer. Jour. Med. Sci.* 1912, ii, 1[illegible]; [6]*Ann. Surg.* 1912, ii, 863.

GONORRHŒA.

C. F. Marshall, M.D.

DIAGNOSIS.—Schwartz and McNeil[1] report further experience with the *complement fixation test* in the diagnosis of gonococcus infections of the genito-urinary tract. (*See* MEDICAL ANNUAL, 1912, p. 304) A polyvalent antigen is used, because of the wide divergence between different strains of gonococci. It is prepared by growing several strains on salt-free veal agar, neutral in reaction to phenolphthalein; twenty-four hour cultures are washed off the agar slants with distilled water, and the resulting suspension is heated for two hours in a water-bath at 56° C. It is then centrifugalized and passed through a Berkefeld filter. When the antigen is used, one part of 9 per cent saline solution is added to nine parts of antigen to make it 0·9 per cent saline.

The authors' conclusions are as follows: (1) The test is absolutely specific, and a positive reaction signifies the presence or recent activity of a focus of living gonococci. (2) A negative reaction does not exclude it, but is of considerable diagnostic importance. (3) A strong positive reaction does not occur before the fourth week, and only then in very acute cases with some complication. (4) No reaction is obtained if the disease is limited to the anterior urethra. (5) A positive reaction does not disappear till seven or eight weeks after cure, owing to the persistence of antibodies in the blood; therefore, if it is obtained seven or eight weeks after apparent clinical cure, the patient must be regarded as still harbouring gonococci. (6) The technique of complement fixation is simpler than that of isolation of the gonococcus in culture, and has less possibilities of error. (7) In cases regarded clinically as post-gonorrhœal a positive reaction is obtained in 31 per cent. (8) In 62 cases of chronic prostatitis of less than three years' duration, the reaction was positive in 54 per cent. (9) In 165 cases regarded as clinically cured, the reaction was positive in 13 per cent. (10) In women, the reaction is positive only when the cervix is involved. (11) The complement fixation test is useful in gynæcology owing to the uncertainty of bacteriological diagnosis. (12) The test is of value in the diagnosis between gonococcal and other forms of arthritis. Three cases of gout gave a negative reaction, although one patient had had gonorrhœa four times. A case of syphilitic arthritis gave a negative gonococcus reaction but a positive Wassermann. Another case of syphilitic arthritis had gonorrhœa four times, the last one thirteen months previously; but the test was negative and the Wassermann positive. Negative reactions were also obtained in streptococcus and tuberculous arthritis and in arthritis deformans. Three cases with clinical symptoms of acute rheumatic fever gave a positive reaction, but in these there were other signs of gonorrhœa, and the gonococcus was present in two. These cases show that the test does not exclude the presence of some other concomitant infection. (13) The test is of no value in the differential diagnosis of arthritic cases which have recently been treated with gonococcus vaccine.

Comparing the gonococcus complement fixation test with the Wassermann reaction for syphilis, the authors point out that in the former there is a true antigen-antibody combination, as the antigen is prepared from the specific organism, while in the Wassermann reaction there is no true antigen-antibody combination. The so-called antigens in the latter reaction are present in the lipoidal substances of the tissues, whether syphilitic or not. Again, a negative reaction in the test for gonococci is of more value than in the Wassermann reaction, for in the latter case the reaction may be negative owing to recent mercurial treatment, or owing to the enclosure of spirochætes by a connective tissue capsule which hinders the absorption of toxins and the consequent formation of antibodies.

Comparing the relative diagnostic value of complement fixation and bacteriological methods, the authors remark that bacteriological proof of the presence of the gonococcus is difficult to obtain. A Gram stain properly made can be accepted when the gonococci are abundant, but not in chronic cases with few organisms present. The sources of error include *M. catarrhalis*, degeneration forms of Gram-positive cocci which do not retain the Gram stain, *Trichomonas vaginalis*, and aberrant forms of *B. coli*. Hence bacteriological diagnosis depends on culture, the technique of which is more difficult than that of the complement fixation test. The gonococcus grows only in special media, and culture may fail owing to the presence of other rapidly-growing organisms which inhibit its growth or render its isolation impossible. This applies especially to women. They conclude that the complement fixation test gives better results than those of bacteriological diagnosis, except when the gonococcus is isolated in pure culture. They also point out that the absence of a positive reaction in the early stages of infection is useful in differentiating between a fresh infection and the recurrence of an old one, and that this may be valuable in medico-legal problems.

Schwartz and McNeil's results have been corroborated by several other observers.

Gardner and Clowes[2] have also tested cases in which both gonorrhœa and syphilis were present. They find that the complement deviation test for gonorrhœa, when carried out with a polyvalent antigen, permits of specific differentiation even in the presence of syphilis and other diseases which cause complement deviation. Cases with a strong Wassermann reaction for syphilis generally gave a negative gonococcal reaction, and the exceptions showed evidence of concomitant gonorrhœa.

Pedersen[3] mentions that *M. catarrhalis* is in its early cultures Gram-positive and in later cultures Gram-negative. Hence, as it is morphologically similar to the gonococcus, the only means of differentiation is by culture. He also mentions that bacteriologists have found at least twelve different strains of the gonococcus, with different degrees of virulence, and that this accounts for the wide divergence in the incubation, course, and complications of different cases.

TREATMENT.—Pedersen[4] recommends either of the following methods for *abortive treatment* of gonorrhœa in the male: (1) Swabbing out the first inch of the urethra with 3 to 5 per cent **Silver Nitrate** solution through a short urethroscopic tube. (2) Irrigation of the first three inches of the urethra by a small catheter and hand syringe with any mild antiseptic. (3) Instillation of any of the newer silver salts in strong solution by means of a drop-bottle, retaining the solution for ten to twenty minutes, and repeating the application twice or thrice daily for three days. The penile urethra should be closed beyond the desired spot by a clip or elastic band. The foreskin and glans must also be disinfected, to prevent auto-infection of the urethra. He remarks that very few patients come early enough for abortive treatment to be successful, and that statistics of success cannot be complete unless they rest on smear and culture diagnosis, and distinguish the desquamative or prepurulent stage when gonococci are present in epithelial cells, without pus.

In *acute anterior gonorrhœal urethritis* the treatment may be expectant or by irrigation. Pedersen limits irrigation treatment to cases of anterior urethritis with no congestion of the prostate appreciable to rectal examination. He uses Chetwood's double-current apparatus with a large vessel never higher than the patient's ear, thus giving pressure equal to that of the urine during micturition. In expectant treatment the urine is diluted and neutralized by **Potash, Soda,** or **Lithia,** to render it less irritant. The precipitation of crystals, such as sodium urate, should be avoided, as they cause irritation. The tendency to chordee is diminished by small doses of **Aconite** every one or two hours during the day.

In *acute posterior urethritis*, which occurs in greater or less degree in the majority of cases, irrigation should be avoided, because hydraulic pressure may damage the delicate structures in the posterior urethra and favour penetration of the infection. Expectant treatment should, therefore, be adopted till the acute symptoms have subsided. Severe cases require rest in bed, with hot or cold applications to the perineum, or rectal irrigations. Autogenous **Vaccines** may also be used. Posterior urethritis which persists requires irrigation. The best method is by a small catheter passed into the bladder, after urination. The bladder is then irrigated to prevent infection, filled with boric acid lotion, and afterwards with **Silver Nitrate** (1–20,000 to 1–5000) or **Potassium Permanganate** (1–10,000 to 1–4000). The patient then evacuates the bladder. Urinary antiseptics should also be administered before and during irrigation. Another good method of irrigation is by a small catheter and hand syringe, by which pressure can be carefully regulated. Heat to tolerance is essential in these manipulations. Opium may be given if necessary. Pedersen does not believe in irrigation of the deep urethra under high pressure from the meatus, because it may lead to complications.

In *chronic gonorrhœal urethritis* Pedersen advocates Buerger's **Urethroscope,** a modification of Goldschmidt's. This has, like the other, a lateral instead of a terminal opening, but smaller, so as to prevent undue prolapse of mucous membrane into it. The system of lenses magnifies about five diameters, and the instrument has curved and straight ends which are interchangeable. Pedersen prefers the latter, by which the whole urethra can be examined, from the neck of the bladder to the meatus. He is of opinion that no case of gonorrhœa should be discharged as cured till after this examination. By this means thickening, granulations, and papillomata of the mucous membrane can be recognized and treated through the urethroscopic tube with the electric cautery or chemical caustics.

Harrison and Houghton[1] report on the use of **Heated Sounds** in gonorrhœa. This method, introduced by Valentine, is based on the fact that the gonococcus is destroyed by exposure for six hours to a temperature of 104° F., and that when patients with gonorrhœa contract a fever with high temperature the discharge ceases for the time. The apparatus used consists of a double silver catheter. The outer tube is closed at the vesical end, and is provided with an outlet for the injected water. The inner tube is connected with an irrigator by means of a rubber tube with a clip. The method of procedure is as follows: A suppository of $\frac{1}{2}$ grain atropine is inserted the night before, and the morning of operation. The urethra is now irrigated in the usual way. The patient then lies on a couch, and the instrument is introduced as far as the bladder. The irrigator is placed 18 in. above the couch and is filled with water at 114° F. The water is allowed to run through the apparatus, and the temperature is gradually increased up to 125° F. This is continued for thirty minutes. A higher temperature may cause blistering of the meatus.

Treatment on the same principle may be applied by means of **Kobelt's Electrically-heated Bougies.** These are gum-elastic or metal bougies heated by an electric resistance coil enclosed within them. In the circuit between the bougie and the source of electricity is another resistance coil, in which is inserted the bulb of a thermometer which records the temperature. The source of electricity is either an accumulator, or the main supply converted. The patient is prepared with atropine, and the urethra irrigated as above. The current is then turned on, and the temperature regulated through the resistance at the electrical source. The temperature may be raised to 130° F., and maintained for fifteen minutes without damage to the tissues. With either form of apparatus the best results have followed the application of the bougie two or three times a week. The results are said to be good in acute, subacute and chronic cases of gonorrhœa. In 11 acute cases the gonococci disappeared after the fifth day. As regards complications, 2 cases of mild epididymitis occurred out of 35. Harrison suggests that this method may act like Bier's congestive treatment, as well as by direct action on the gonococci.

Discussing the subject of *gonorrhœal arthritis* and its treatment, Dardel[2] says that benefit is sometimes derived from **Salicylate of Sodium** and **Aspirin** in acute cases, and that the axiom that salicylate of sodium differentiates between ordinary and gonorrhœal rheumatism must not be construed literally. If these fail **Antipyrin, Pyramidon,** or **Quinine** may be tried. However, such treatment is symptomatic, and does not influence the cause of the disease. Local treatment includes **Puncture** of the joint if there is much distention, **Passive Movement** and **Massage** when the acute symptoms have subsided, and **Arthrotomy** in suppurative cases. More recent treatment comprises gonococcal **Vaccines**, by Rogers's antigonococcic, or by antimeningococcic **Serum, Radiotherapy** by means of exposure to radium, radio-active mud or injection of radium salts into the joint. Bier's method of **Passive Hyperæmia,** and **Thermotherapy.** The author prefers the last method, either by douches or by placing the joint in a hot-air box. The temperature in the latter may be raised to 175° or 210° F. for half an hour at a time. Hot-air treatment is easier to apply by means of electrically-heated apparatus. Good results are also obtained by **Hydrotherapy,** in the form of hot-water or hot-vapour douche. At Aix les Bains the natural mineral sulphur water is applied as a local douche at a temperature of 105°–110° F. for ten to fifteen minutes, and followed by passive movement and massage. In the vapour bath the limb is immersed in the atomized hot water for about twenty minutes, after which passive movement and massage are performed. This is indicated in partly ankylosed joints, but not in acute cases. In chronic gonorrhœal arthritis, in addition to the above methods, the urethra requires disinfection, as many obstinate cases depend on chronic urethro-prostatitis. Some authors have reported improvement after **Thyroid** treatment, 2 to 6 grains daily.

Vaccines.—Guerchoune and Finnkelchteinne[7] report good results in acute and subacute gonorrhœal urethritis, as well as in arthritis and epididymitis. The gonococci disappeared in 10 out of 27 cases of acute and subacute urethritis. The authors used a polyvalent heterogenous vaccine made from cultures of gonococci on agar mixed with water or blood. The dose for the first injection was 2 million cocci, and this was doubled at each injection, the maximum being 50 million. The authors advise the use of two vaccines, one containing small doses and the other large. Injections were made subcutaneously into the arm or the abdominal wall every six or seven days. No other treatment was given, so as to determine the effect of the vaccine, but the authors recommend its combination with the other measures usually adopted. The vaccine reaches gonococci which have penetrated deeply or become generalized, and its action is probably due to the formation of antibodies.

Erlacher[8] also, has found vaccine treatment successful in acute and chronic gonorrhœal urethritis. He begins with a dose of 5 million cocci given every four days, increased in some cases up to 28 million. Local treatment is given at the same time. He concludes that vaccines are a useful addition to the treatment of acute and chronic gonorrhœal urethritis, both on account of their curative action and also their diagnostic value as regards a cure, for vaccine treatment will produce a gonococcal discharge in cases apparently cured by local silver treatment. In Erlacher's cases there was a general reaction in exacerbation of symptoms, but no local reaction at the point of puncture.

Pedersen[9] also recommends vaccines in acute posterior urethritis, preferably autogenous, owing to the variations in the different strains of a stock vaccine. He prefers large doses to small. In one successful case of double chronic relapsing seminal vesiculitis, he gave 400 million cocci every other day, three times a week, and finally once a week.

B. Hughes[10] considers that chronic gonorrhœal arthritis is due to mixed infection by gonococci and staphylococci. He therefore recommends a mixed vaccine of gonococci and staphylococci, beginning with 100 million of the former and 150 million of the latter, increased to 500 million and 1000 million respectively. After the second dose, joint adhesions are broken down under an anæsthetic, followed by massage and daily movements during the vaccine treatment. Autogenous vaccines are best. If there is chronic gleet, the penis should be massaged over a stout metal bougie followed by a **Protargol Bougie.** **Copaiba** should be given internally.

Riboulet[11] thinks that **Balsams** are contraindicated in the early stages of gonorrhœa, that they increase the duration of the disease, and often favour complications. He points out that the balsams have no bactericidal action on the gonococcus, and only diminish pain and suppuration. But suppression of suppuration in acute gonorrhœa counteracts the natural means of defence by phagocytosis and leaves the gonococci free to penetrate the mucous membrane. Balsams should, therefore, be limited to the later stage of gonorrhœa when the gonococci have mostly disappeared, and should be given in large doses.

Harrison[12] recommends **Agar Jelly Bougies** in subacute and chronic cases of gonorrhœa. They are made of 90 parts of 2.5 per cent agar jelly melted and added to 100 parts distilled water. When cold this is rubbed up with 1 part of **Protargol.** By this means the drug is kept longer in contact with the mucous membrane.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* 1912, ii, [illegible]; [2]*N.Y. Med. Jour.* 1912, ii, 734; [3]*Ibid.* 1913, i, 327; [4]*Ibid.* 1913, i, 327, and 1912, ii, 779; [5]*Jour. R.A.M.C.* 1913, [illegible]; [6]*Manual of Venereal Dis.* 1913, [illegible]; [7]*Med. Rec.* 1913, [illegible]; [8]*Lancet*, [illegible]; [9]*Deut. med. Woch.* [illegible]; [10]*N.Y. Med. Jour.* 1913, i, [illegible]; [11]*Inter. Med. Jour.* 1913, i, [illegible]; [12]*Jour. R.A.M.C.* 1912, Oct.

GOUT.

Herbert French, M.D., F.R.C.P.

TREATMENT.—The fact that opinions differ so widely is an indication that no absolute rules as to **Dietary** can be laid down, and this is the view held by Garrod.[1] He maintains that in food there are potent substances which are essential to normal metabolism, though negligible from a calorie-producing point of view; and that more knowledge is needed before we can possibly lay down rules of dietary on scientific lines. Most theoretical diet tables for gouty subjects have been drawn up by those whose minds were at the time occupied with one particular scientific fact, to the exclusion of others which are often of still greater importance in practice; and the results have not been as beneficial to patients as was hoped. The main thing for a gouty subject is to be moderate in all things, and to take simple rather than complex foods. In special cases, extreme dietaries may be of use as temporary expedients, such as one which aims at the exclusion of all purin substances; but Garrod is convinced that no diet which excludes altogether one or more of the main ingredients of human food, or even a minor constituent such as the purins, can be regarded as a desirable one over long periods. It is less a matter of what one eats than of how much one eats, and when and how. Garrod doubts whether by strictly dieting a gouty patient as much is achieved as we think. It must be confessed that among hospital patients who could not, if they would, follow out any strict rules of dietary, who seldom pay heed to our advice that they should give up beer, and who, as soon as an acute attack is over, revert to their previous habits of life, the course of gout does not seem to differ materially, as regards the character, frequency, and severity of the attacks, from that followed in people who are able to adjust their living according to the best advice to be obtained.

Errors of diet are not the only factors at work in the causation of gout, and regulation of food is only one of the means available for its control. Temperance in all things, and not in eating and drinking alone, is the golden rule for the avoidance of this disease and its manifestations. Amongst the well-to-do, **Golf** is probably more important than a purin-free dietary in this respect.

The value of **Atophan** in the treatment of acute and subacute gout is spoken well of both by Kahlo[2] and Brugsch.[3] The drug has apparently a definite chemical formulary, consisting as to two parts of phenylchinolin and as to four parts of carboxylic acid. It is dispensed as a rule in tablets, each containing 7½ gr. of the drug; these disintegrate readily in water, though they are insoluble. Kahlo prescribes one after each meal and at bedtime, but in severe cases increases the total dose per diem up to as much as 60 gr. The only ill effects noticed were a certain amount of upset of the stomach; the acute gout was relieved speedily, the temperature, pain, and swelling lessening within a very few hours, and almost all the acute symptoms subsiding within from twenty-four to forty-eight hours. A large majority of his cases had been treated previously by colchicum, salicylates, aspirin, etc., and almost without exception, they stated that the relief obtained from atophan was greater than that received from remedies previously employed. Burgsch also speaks well of a preparation discovered by Prof. Wolffenstein in the treatment of acute gout; it has a very complex formula, expressed by the name acetyl-aceto-salicyl-trichlor-isobutyl-ester.

REFERENCES.—[1] *Lancet*, 1913, i, 1700; [2] *Ther. Gaz.* 1912, 842; [3] *Berl. klin. Woch.* 1912, 1597.

GRANULOMA, PUDENDAL. *Leonard Rogers, M.D., F.R.C.P.*

J. Grindon[1] reports three cases from St. Louis. He failed to find the protozoa-like parasites described by Donovan and Carter in India. His cases were all in negroes; but no history of contagion could be obtained. Spirochætes may also be absent.

REFERENCE.—[1] *Jour. Cutan. Dis.* 1913, 236.

HÆMORRHAGES IN THE NEWLY-BORN.

Frederick Langmead, M.D., F.R.C.P.

J. E. Welch[1] gives a lucid description of this important but, fortunately, rare disease. The baby may be in every way apparently healthy before the bleeding begins. Then, without warning, it may vomit a quantity of fresh blood or pass bloody or tarry motions, and these may be the only signs of hæmorrhage. The bleeding may be subcutaneous, causing either petechiæ or hæmatomata; or the umbilicus, a divided prepuce, or the gums may be the site of hæmorrhage. Fatal internal hæmorrhages not infrequently occur without external manifestations, and may affect the brain or any of the thoracic or abdominal organs. Jaundice may develop. On the other hand, the baby may merely become pale and feeble, and die without apparent cause, the diagnosis being made only at the autopsy. Then hæmorrhages are found usually within the serous cavities, like that of the peritoneum, or beneath a serous membrane, such as the pleura, the pericardium, or the capsules of the liver or kidney. Microscopical examination of the various organs shows anæmia, and cloudy swelling of the epithelium of the parenchymatous organs, whilst the epithelium of the gastro-intestinal tract usually gives evidence of the most advanced degeneration and desquamation.

Etiology.—Welch believes that the endothelial cells of the blood-vessels are at fault, and that a disturbance in the balance of the ferments of the cells is the immediate cause of the hæmorrhages. This disturbance is due to malnutrition caused in various ways, especially by auto-intoxication due to excessive growth of bacteria in the intestinal tract. He disagrees with the view, held by many, that the disease is due to deficient coagulability of the blood, since in some there is no lack of coagulability, and moreover, successful treatment by serum does not promote local coagulation at the sites of the bleeding. The cure is brought about in some way other than by increasing coagulability—in his opinion, by improving the nutrition of the endothelial cells.

Treatment.—However divergent opinions may be as to the cause, there seems little doubt that the treatment advocated by Welch of injecting with **Human Serum**, is attended by a large measure of success, and that now there is a fair hope of recovery, whereas a few years ago the condition was regarded as practically fatal. The author himself records three more successful cases, making thirty-five in his own practice. He states that there is no danger of anaphylaxis such as occurs if the serum of other animals is used. Transfusion may cause hæmolysis, thrombosis, or embolism, and should be reserved for those cases where prolonged hæmorrhage has led to great reduction in the number of the blood-cells.

Le Grand Kerr[2] advocates the use of **Local Measures** to arrest the bleeding, no matter what internal remedies are used. Capillary oozing may thus be controlled by a gauze pad saturated with a 10 per cent solution of **Gelatin**, a 2 per cent solution of **Calcium Chloride**, or a

1-1000 solution of **Adrenalin.** Prolonged but gentle pressure and the actual cautery also have their place as local agents. Therapeutic efficiency, however, demands something more than a control of local hæmorrhage. He believes that, apart from hæmophilia, hæmorrhagic affections of children are due largely to toxic substances which find their way into the circulation, and that these agents act not only upon the nervous system, but in a direct manner upon the endothelial lining of the smaller blood-vessels, there producing degenerative changes. Thus far he agrees with Welch, but differs in regarding impaired coagulability of the blood as the one feature which is always prominent. The primary objects in the treatment of this affection are (1) To combat the toxic elements which change the character of the blood; (2) To limit their effect on the blood-vessels; and (3) To improve the coagulability of the blood. The last admits of no delay, and in most instances is urgent. He advocates the introduction of **Saline Solution,** when the hæmorrhage has been prolonged or severe enough to demand partial restoration of the volume of the blood; but points out that we should strive to produce a blood which coagulates readily, and that the indiscriminate use of salines may do positive harm by diluting the agents in the blood which make for coagulation. The chief aim of treatment is to supply as quickly and as safely as possible the main elements in which the blood is lacking or which have become inefficient, and while thus controlling immediate consequences, to give the blood-making organs a chance to restore the normal balance. To accomplish this, he, like Welch, recommends **Blood Serum** and **Whole Blood,** and prefers human serum to that of other animals. In his opinion, transfusion is the ideal method. When transfusion is impracticable, 5 or 10 c.c. of whole blood may be withdrawn from a near blood relation and injected immediately into the child subcutaneously. This is particularly applicable to urgent cases, whilst human blood serum is indicated in the less urgent ones. Both should be obtained from a near blood relation. Other details which should not be neglected are, absolute rest of mind and body, adequate hygienic care, a harmless but sufficient diet, and the treatment of the underlying condition if it is discovered.

V. M. Reichard[3] and W. B. Jennings[4] each report a case of melæna neonatorum which recovered after the injection subcutaneously of **Normal Horse Serum.** It is interesting to note that in the case recorded by Jennings, subnormal temperature and urticarial rash were noted during the treatment, and may in all probability be ascribed to **anaphylaxis.**

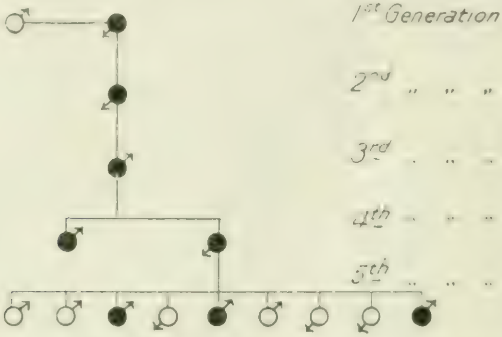
R. Franz[5] has treated five cases with **Blood** obtained from umbilical cords at the birth of normal children. All recovered, the last four rapidly. He collected the blood in sterile flasks, centrifugalized it, and injected it at body-temperature, sometimes as long as four months after it had been obtained. No untoward results followed.

REFERENCES.—[1] *N.Y. Med. Jour.* 1913, i, 125; [2] *Amer. Med.* 1913, i, [illegible]; [3] *Jour. Amer. Med. Assoc.* 1912, ii, 1539; [4] *Ibid.* 1913, i, 1154; [5] *Münch. med. Woch.* 1912, 2905.

HAIR AND NAILS, FAMILIAL DYSTROPHY OF.

J. Graham Little, M.D., F.R.C.P.

Eisenstaedt[1] reports a family affected with this curious disorder. The author unfortunately can give only the affected members in the earlier generations, and the pedigree suffers in exactness for this reason but it is sufficiently remarkable notwithstanding. Here is the pedigree.



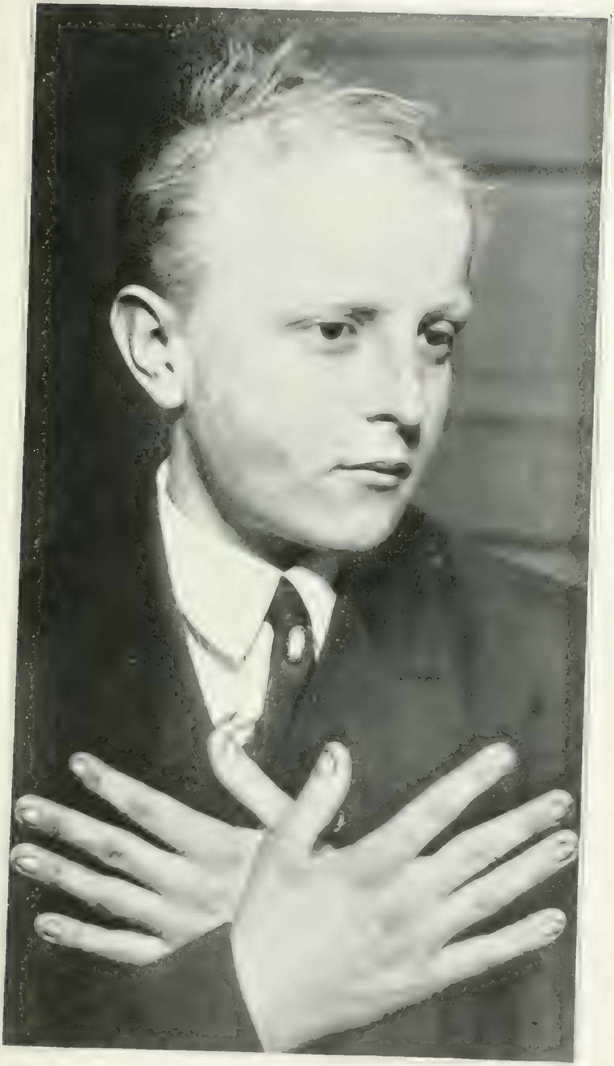
The members affected in each generation are indicated by the darkened symbol. The author says that probably some of the collateral members were affected, but no data of these could be obtained. One of the children of the 5th generation is described in detail, and the description is said to apply to the other two. There was no mental deficiency in any of the three children, whose ages were respectively 14, 9, 1. The thyroid gland, which has been reported absent in a previous series of cases, was defective in one patient aged 9 and normal in the other aged 14. The mother, a French Canadian by birth, died of malignant abdominal disease.

The following are details of the oldest of the three children affected:—

"The scalp is negative, showing no seborrhœa or parasites. The hair-line begins 5·5 cm. from the bridge of the nose. The scalp is covered with a moderate growth of pale downy hairs, none of which is over 2 or 2½ inches in length, in spite of the fact that the patient has not had his hair cut for many months. The hair grows very slowly. The ends are pointed, and none is split or broken off. They are very easily removed and do not break on traction. There seems to be some anomaly in their implantation. Here and there at wide intervals are seen normally implanted coarse brown hairs. Microscopic examinations of the hairs found nothing abnormal. No bacteriological examination was undertaken. The eyebrows are very poorly developed. There are no coarse hairs, and but a small number of lanugo hairs. The eyelashes are extremely sparse and pale. There is a plaque of erythematous lupus on the nose and two symmetrical patches behind the ears. These lesions have made their appearance within the last year. On the right cheek is a nævus flammeus of large size.—[The

PLATE XIX

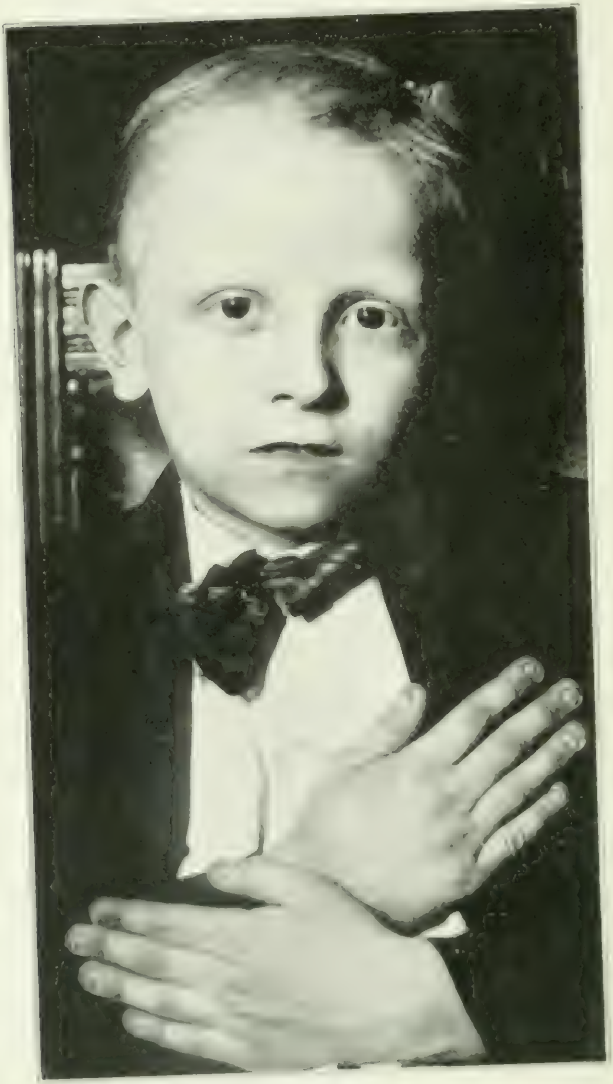
FAMILIAL DYSTROPHY OF HAIR AND NAILS



CASE 1.

PLATE XX

FAMILIAL DYSTROPHY OF HAIR AND NAILS



CASE 2

other patients have not this condition.—E. G. L.] "There is no trace of axillary or pubic hair. The genitalia show no peculiarities and no increase of adipose tissue in this region. In the axillary region and on the anterior surfaces of the knees are sites of a papillary hypertrophy of moderate degree. The hands are normal in contour save for the distal phalanges, which are noticeably increased in volume. The skin on the distal phalanges observed shows a moderate increase in thickness. The nails on the hands are all affected to about the same degree, and show an enormous hypertrophy of the nail-bed (*Plates XIX* and *XX*). The nails are kept short because, if allowed to grow beyond a certain length, they become brittle, and crack at the very slightest trauma. There is no marked accentuation of the striæ, either vertical or horizontal, though a slight increase can be ascertained. Likewise there are no ulcerations about the base of the nail, and no odour emanates from them. The nails of all toes of both feet are affected in a similar manner but to a less degree. The feet are in other respects normal. There is absolutely no sign of hereditary syphilis in any of the children."

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1913, i, 27.

HEART AND AORTA, SYPHILIS OF.

Carey Coombs, M.D., M.R.C.P.

ETIOLOGY.—Oberndorfer's[1] ample material at Munich shows an incidence of syphilitic aortitis in nearly 7 per cent of all autopsies; he places it next to tuberculosis and malignant disease as a cause of death. Two-thirds of the cases were between 41 and 60; they were fairly evenly divided as to sex. Deneke's[2] Hamburg figures, on the other hand, show a large preponderance of males, and include one case of aortitis due to inherited syphilis. This writer also shows that heavy muscular work plays no part in production of the disease.

Recent work (see ANEURYSM) has shown that aortic syphilis is an active process and not merely a dystrophy; this has a bearing on treatment. It is equally important to realize, as Brooks[3] points out, that coronary disease accompanies aortitis in a majority of cases, and that in over 80 per cent lesions of the myocardium are discoverable. These may be found, containing spirochætes, in the secondary stages of the infection. There is therefore such a thing as active syphilitic carditis; and it is on this conception that our clinical and therapeutic study of the disease must be based.

SYMPTOMS.—These begin in some cases during the secondary stage; tachycardia, extrasystoles, and other forms of abnormal rhythm due to local irritation of the myocardium, are described. Physical stress is particularly likely to excite them. Later there may be more definite signs of focal myocarditis; of these, heart-block is the most noteworthy, though it is, of course, very infrequent. Apart from these evidences of focal disease, there are symptoms referable to diffuse myocardial degeneration. The chief of these are dyspnœa on exertion, and pain in the præcordium, often anginal in character. Præcordial tenderness and cyanosis are also common. To involvement of the heart muscle must be attributed the notorious liability to sudden death in these cases.

Apart from these evidences of myocardial disease, there are the familiar symptoms of aortic regurgitation in a number of cases. According to Longcope,[1] syphilis is responsible for three-quarters of all cases of aortic insufficiency in adults. [This figure is probably rather high for Great Britain.—C. C.] Finally, there are the symptoms and signs which arise directly from syphilitic infection of the wall of the aorta; this includes evidences of saccular aneurysm, and also those of diffuse dilatation of the aorta. In this connection it should be recollected that inequality of the radial pulses, so closely associated with aortic aneurysm, may occur in syphilitic aortitis apart from the pressure of a sac. The writer has seen one example of this in which x-ray examination and the subsequent course proved the absence of aneurysm; and Laignel, Lavastine, and Vinhit,[5] who report three cases in which the pulses felt unequal and gave widely different sphygmometric curves and sphygmomanometric readings, were enabled in the same way to determine that there was no aneurysm. The cause of the inequality seems to lie in inflammatory obstruction or stenosis at the origins of the great vessels; at any rate, changes of this kind were noted in the only autopsy which they performed.

DIAGNOSIS.—The *Wassermann reaction* is recommended by several writers. Oberndorfer says it is of fundamental importance, and since its routine application to all cases of cardiac disease has been adopted at his hospital, syphilitic aortitis has ceased to be a post-mortem-table surprise; and Deneke obtained a positive reaction in 80 per cent of his cases, even in the days when the technique of the test was less perfect than now. Longcope, Brooks, and Babcock[6] also insist on its value; the last-named says that the positive results are reliable but not the negative, while Brooks thinks it is the most definite sign available of late tertiary or quaternary syphilis, and specially important in view of the large number of persons who make misleading statements as to their venereal history.

Brooks further insists on the value of the response to antiluetic treatment as a diagnostic aid, particularly in cases where the Wassermann test and the patient's history are alike indeterminate.

Apart from these indications, if the fact that syphilis not infrequently causes heart disease be borne in mind, fewer mistakes will be made; and the diagnostic value of collateral evidences of syphilis, such as tabes, is alluded to by Deneke.

PROGNOSIS.—"Unfortunately," says Deneke, "most patients do not come to the doctor till they experience pain and evidences of cardiac inadequacy." This fact renders the average prognosis worse than it would be otherwise. He gives some very interesting figures showing how bad the outlook is. Of 33 cases diagnosed at the beginning of 1909 or earlier, 28, or 84 per cent, were known to be dead by November, 1912; at this same date 31 out of 47 diagnosed in 1910, or 70 per cent, had succumbed; while of the 60 seen in 1911, 53 per cent had already terminated fatally. These fatal cases are examined from the point of view of the relative fatality of each type of lesion. Of those with signs of aortitis, but none of aneurysm or aortic regurgitation, 33 per cent were dead; of those with both aneurysm and aortic regurgitation, 67·0 per cent; of those with aneurysm only, 64·3 per cent; of those with valvular disease alone, 62·5 per cent. The immediate cause of death in 74 fatal cases was rupture of aneurysm in 9, angina in 5; sudden death occurred in no less than 33. In 7, respiratory complications were responsible, and in 15, death was due to some complication (once to sepsis following salvarsan, 7 times to other syphilitic lesions). Deneke's figures also show that patients thoroughly treated with antisyphilitic drugs live twice as long as those less carefully handled.

Treatment.—Many say that vigorous anti-syphilitic treatment will bring about great improvement and even cure. Brooks is one of these. He puts his patients to bed if their cardiac symptoms seem to demand it, but not otherwise; and is guided by the same rule in regard to cardiac tonics. He uses both **Mercury** and **Salvarsan**; the former is given by inunction, or hypodermically in the form of salicylate dissolved in sterile albolene. After this has been carried on for a few days at least, he begins salvarsan, his reason for using it being its greater rapidity of action rather than any intrinsic superiority over mercury. He gives it intravenously, and finds it much safer to divide the dose of ·6 gram into several injections; to give the full dose at one sitting is to incur grave risks, and he nearly lost three patients through doing so. To these directly antispirochætal drugs, **Potassium Iodide** may be added, especially when the symptoms suggest the presence of gross focal lesions in the myocardium.

There is some variance of opinion about salvarsan in cardiac syphilis. Few observers seem to doubt its efficacy, but some speak strongly as to its dangerous by-effects. Longcope thinks it should be given in repeated doses; Babcock says that if he gives it at all, he takes the precaution of getting the patient to sign a paper declaring that the risks of the treatment have been fully explained to him! The general opinion seems to be, however, that it should be withheld from severe myocardial symptoms, at any rate till these have been abated by rest and other measures; that it should be given intravenously in small doses repeated at adequate intervals; that mercury should be given in conjunction with it; that each dose may produce immediate symptoms of an alarming character, which should be provided for; and that it is essential to follow up the treatment for a long while.

References.—[1]*Münch. med. Woch.* 1913, 505; [2]*Deut. med. Woch.* 1913, 441; [3]*Amer. Jour. Med. Sci.* 1913, ii, 513; [4]*Arch. Int. Med.* 1913, 14; [5]*Presse Méd.* 1913, 607; [6]*Med. Rec.* 1912, ii, 684.

HEART, DISEASES OF. (*See also* ANEURYSM; ANGINA PECTORIS; AURICULAR FIBRILLATION; AURICULAR FLUTTER; DUCTUS ARTERIOSUS, PERSISTENT; HEART AND AORTA, SYPHILIS OF; HEART-BLOCK; PERICARDITIS.)

Carey Coombs, M.D., M.R.C.P.

Cardiac Efficiency in Schoolboys.—Mumford's[1] discussion of the exercises for which the adolescent heart is normally fit will be found useful by all who have school children under their care. He says that almost any boy who is fit to attend school at all is fit to join in Swedish exercises. Any healthy child of nine or ten should be able to run or scamper a hundred yards, yet quite a number cannot. This failure does not as a rule denote cardiac disease, but it should nevertheless be noted for further observation. Boys under thirteen should run the hundred yards in about 14 seconds without serious strain. For boys under fourteen, time limit is inadvisable for anything above 220 yards. At the school to which Mumford is medical officer, half-mile sprinting for boys under sixteen is allowed, with a time limit of 2 minutes 40 seconds; and the school limit for the mile is 5 minutes 35 seconds. The time needed for recovery of normal pulse-rate is noted in all doubtful cases. High and broad jump figures are also given. As for swimming, he says the temperature of an ordinary swimming bath should not be below 70° F., and he points out that the feebler the physique of the bathers, the higher must the temperature be.

"*Phrenocardia.*"—This is a special type of cardiac neurosis fully described by Behrenroth,[2] who insists upon its characteristic nature. He found 19 cases among 370 patients complaining of functional cardiac disorders, 17 of whom were women, the ages of all the patients falling between twenty and forty-seven years. The first symptom is pain, referred as a rule to the left lower præcordium, and sometimes associated with cutaneous hyperæsthesia in the same area; the pain is like that of a wound or stab, or else cramp-like. It has some association with the respiratory movements, and is connected by various writers with changes in the diaphragm. A result of this connection is to be seen in the peculiar and characteristic form of interrupted breathing that accompanies it, in which a respiratory pause of varying duration is followed by several "cogwheel" inspirations. A sighing type of inspiration is often noted. Various alterations of the cardiac rhythm also occur; on the average, the rate is quicker than normal; these alterations are accompanied by abnormal cardiac sensations of varying type, which are classed together under the head of "palpitation." Physical examination discloses no evidence of cardiac disease. Spastic constipation is a common accompaniment; in some cases the patient shows other evidences of a neuropathic habit, while occasionally phrenocardia is associated with compensated heart disease. Attacks may occur which simulate angina, but at the same time bear some of the characteristic marks of hysteria, one feature being the excessive bodily restlessness of the patient during the attack. Chief among the causal factors of this neurosis, Behrenroth places sexual perversions and dissatisfactions of various kinds. This is of importance in regard to treatment, which must have respect to the cause and the possibilities of correction. Regulation of the patient's diet and manner of life is of prime importance, and constipation must be remedied. Among the drugs that are useful, Behrenroth mentions **Bromides** given for a short time in small doses, **Valerian** preparations, and pills of **Lupulin** with **Camphor.**

Parkes Weber[3] describes a case of *mitral dwarfism*. Unlike the French writers, who regard the mitral stenosis and the general failure of growth as being examples of the association of inborn defects, he thinks the valvular lesion was acquired and probably rheumatic in his case, and that, being established early, it interferes with the processes of growth to such an extent as to lead to dwarfism. As he points out, the mitral is but one of several forms of cardiac infantilism.

Anders[4] gives an illuminating account of *hydrothorax* complicating cardiac disease. Of 27 cases, 16 were examples of myocardial disease, and in 5 of these renal lesions were detected. In 13 of the 16 the hydrothorax was right-sided only. In spite of the fact that very large quantities of fluid may collect within the pleural cavities, they are often overlooked. Careful physical examination, coupled with a judicious application of exploratory puncture, is the corrective for this error. Once found, the fluid should be withdrawn by **Paracentesis,** and the cardiac condition treated by **Rest, Cardiac Tonics,** and rather free **Purgation.**

Auscultation.—Of all the physical signs of mitral stenosis, Core[5] regards the *reduplication of the second sound* at the apex as the most constant and reliable. He bases this opinion on a clinical study of 173 cases.

Schliefs'[6] examination of 273 children without cardiac disease discovered a *systolic bruit* in 100; about two-thirds of these were cardio-pulmonary in origin, the remainder being of the "atonic" type, occurring in flabby, anaemic children. The latter is an indication for treatment of the underlying cause. The gist of this investigation is to show that it is unwise to accept a bruit alone, without other physical signs, as proof of the existence of organic disease of the heart in a child. An equally instructive statement is that made by R. T. Mackenzie,[7] who examined 266 healthy young men immediately after brisk exercise, and found a systolic murmur in 74, or 27·8 per cent. About half of these bruits were purely pulmonic, and their variation with posture suggests that many belonged to the cardio-respiratory class. The large percentage in which these bruits appears should constitute a powerful warning against a diagnosis of heart disease based on the development of a bruit during exertion.

Arrhythmia (see also Auricular Fibrillation; Auricular Flutter; Heart Block).—Lead colic is not infrequently associated with *slowing of the pulse.* The nature of this bradycardia has been investigated by Lian and Marcorelles,[8] whose tracings show that the whole heart is slowed and that under the influence of atropine the pulse is quickened, proving that it is due not to intracardiac disease but to extracardiac influences acting through the vagus, and probably toxic in origin. They note that the bradycardia is dependent neither upon the blood-pressure nor upon the abdominal pain.

Three very remarkable cases of slow irregular pulse are recorded by Lewis.[9] In the first, slowing of the whole heart was confused from time to time by the appearance of a slower regular rhythm arising in the auriculo-ventricular junctional tissues. The second case is even more curious: an otherwise healthy young man had a slow and often irregular pulse, with entire absence of polygraphic or electrocardiographic evidences of auricular systole—an inexplicable type of arrhythmia. In the third case, the radial pulse was regular at 20 to 33 per minute, and fits of the Stokes-Adams type occurred; slowing was due not to heart block, but to interposition of premature beats arising in the ventricle, every alternate one of which "retrograded" into the auricle.

Windle[10] summarizes his experience of the *alternating pulse* as exhibited by forty-five patients under his care, suffering from cardiosclerosis, post-rheumatic heart disease, pneumonia, paroxysmal tachycardia, and acute rheumatic carditis. In the first type it is not uncommon; and wherever it occurs it adds to the gravity of the prognosis, since it presages failure of contractile force.

Technique of methods of investigation cannot be described here. For accounts of the graphic records of heart sounds, papers by Lewis,[11],[12],[13] Fahr,[14] Watson Wemyss and Gunn,[15] and Cohen[16] may be consulted. The principles and methods of electrocardiography are discussed by their master, A. D. Waller.[17],[18] The radiological examination of the heart, an important aid in cardiac diagnosis, is described by Lebon and Aubourg[19] in a temperate paper. Rautenberg[20] gives a brief account of results collected by his oesophageal method of recording graphically the movements of the left auricle.

PROGNOSIS.—In a discussion at the Seventeenth International Congress,[21] Walsh, of New York, emphasized the importance of encouraging cardiac patients to think as well of themselves as possible, the influence of mind on body being particularly well marked in this class of case. "The practitioner is justified in giving the best prognosis he can, or even better still," to sufferers from morbus cordis: a statement with which all who see many of these patients will cordially agree.

The outlook in *valvular disease* is not so universally gloomy as it is sometimes painted. Heinrich[22] quotes examples from his own experience and from the literature to show that patients may carry apparently serious lesions of the aortic and mitral valves for thirty years or more, and present at the end of that time all the evidences of adequate compensation. He lays proper stress on the importance in aortic valvular disease of considering the cause of the lesion and its direct influence on the condition of the myocardium. The syphilitic and arteriosclerotic cases, in which there is inevitably progressive interference with the health of the cardiac muscle, have a poorer outlook than those in which the valvular lesion follows rheumatism, always provided the patient has emerged from the decades during which there is probability of rheumatic re-infection of the heart.

Cautley[23] writing of the prognosis of *heart disease in children*, says much too grave a view has been and is still taken of the slighter affections; the outlook depends mainly on the state of the cardiac muscle. In each case we should find out what is the prospect of compensation being established and maintained; the greater the number of valves affected the less is their prospect, i.e., the prognosis is worse in combined aortic and mitral disease than in mitral disease alone. Again, valvular obstruction is harder to compensate for than mere insufficiency. The state of the myocardium is of particular importance, since it is always injured more or less in rheumatic carditis, and often in other infections, such as diphtheria, scarlet fever, and influenza. Anginal attacks, which he finds not uncommon in children, are of bad omen. Cautley attaches some importance to what he regards as a sign of pericardial adhesions, viz., a small rapid pulse in cases of rheumatic "big heart" in which treatment has been careful and adequate. The greater or less development of those physical signs which are directly due to the lesions (e.g., murmurs and thrills) must also be considered, though these are notoriously disproportionate to the severity of the lesion; a loud bruit may be functional, or it may, if organic, prove no more than that the heart is acting vigorously. The presence and amount of hypertrophy or dilatation are important points; great hypertrophy proves a severe lesion, and a heart near the limit of its powers, while persisting dilatation suggests a poor condition of the myocardium. Dropsy is rare; when it occurs it is of grave significance, and malnutrition generally may be regarded as a measure of the severity of the cardiac lesion. In rheumatic cases, much depends on the degree to which the child proves prone to active outbursts of the infection; this depends in part on heredity, in part on social and climatic environment, and is hard to estimate except by actual observation of the patient's career.

The prognostic aspects of heart disease in its relation to *pregnancy*, were dealt with by various speakers at the German Gynaecological Society's Congress.[24] Fromme said that of 200 women with heart disease, 3 per cent died during pregnancy, labour, or the puerperium, while between 9 and 17 per cent terminated in abortion or premature labour. Baisch's figures relate to 200 pregnant women with valvular lesions; in half, symptoms of decompensation were manifest, of a severe grade in a quarter, while death occurred in five cases. In about half, the heart was worse after than before pregnancy. Approximately, one-third of the pregnancies failed to go to term. Kreisler's statistics from Dresden, showed that of over 23,000 labours, 26 were induced artificially on account of cardiac disease; in 16 of these the lesions were mitral, in 3 aortic, and in 7 myocardial; 4 ended fatally, 2 from sepsis.

TREATMENT.—Two interesting discussions on the treatment of heart disease in children emphasise the predominant part played by *acute cardiac rheumatism* and the difficulties that lie in the way of its treatment. Cautley,[24] opening the Royal Society of Medicine discussion, laid stress upon the need for recognizing that in every case of the disease the heart muscle is directly injured, a fact which explains much of the beneficial effect of **Rest** for such patients. He thinks **Blistering** of use if the pericardium is obviously inflamed, and uses **Mercury** (as Guy's pil. digitalis co.) if the liver is engorged. Mackenzie insisted on the necessity of accurate diagnosis as a prelude to successful treatment. Hay quoted with approval the statement of a Viennese professor "that alcohol should be excluded from the pharmacopœia of children." Carr agreed that digitalis cannot help a heart which is in the grip of a toxin; during convalescence he has found pure **Cod Liver Oil** of more advantage than if diluted with malt and other things. Sutherland added a timely warning as to the harm which may be done by treatment where none is indicated, viz., in the "obsolete" stage of carditis where all active inflammation has died down. The value of **Opium** in carditis was spoken to by Morison.

At the British Medical Association meeting, Poynton,[25] after laying stress on the fact that prevention is better than cure almost more in regard to acute cardiac rheumatism than in any other disease because of the irreparable nature of the damage done, gave his experiences of **Vaccines** in this disorder. These were not wide enough to justify generalizations, but they show that it is a method to be used cautiously if at all, as in some cases the injection of vaccine was quickly followed by serious relapse. The only drug to which he gave special praise was **Theocin Sodium Acetate,** given in small doses of 2 to 4 gr. two or three times a day after food, in tablet form. It is indicated in cardiac disease accompanied by dropsy. Miller and the present writer declared their belief in the efficacy of **Salicylates** within limits; the drug should not be overdone, it should be combined with alkalies and purgatives, and, above all, too much should not be expected of it. The damage that is already done by the infection cannot be repaired by the drug, the activities of which are practically limited to the prevention of further injury. Nash as well as Poynton said rheumatic children needed special convalescent homes. The general opinion agreed with that of most physicians with wide experience of cardiac rheumatism, that pericardial effusion demanding paracentesis is an almost unknown complication of this disease. Another contribution to the same study is that of Gilbert,[26] who lays much emphasis on the need of **After-care** in acute rheumatic carditis; it should be considered as acute over a much longer period than has been the custom. Treatment should be carried out over months and perhaps years, until all possible signs of acute disease have disappeared, and even then, until adolescence is passed, at least a certain amount of restraint should be exercised. This statement is borne out by the satisfactory results obtained in his experience.

Vaquez's[28] summary of the **Dietetics** of heart disease runs counter, in some ways, to generally received opinions, for he exonerates food excess from all responsibility for the causation of cardiosclerosis, and impeaches alcohol instead. He is impressed with the need for restricting the general fluid intake, at least in so far as this tends to be excessive. The use of **Sugar** in heart disease, introduced several years ago by Goulston, receives new support from Denyer,[29] who gave large quantities (from half a pound downwards in twenty four hours) to an apparently moribund patient suffering from cardiosclerosis, with surprisingly successful results.

Capps and Matthews[30] used the venous blood-pressure—a subject inadequately studied in Britain—as an index to the value of the various drugs used in the treatment of circulatory disease. The work was entirely experimental. Pituitrin and epinephrin raised the venous as well as the arterial pressure; alcohol in full doses lowered the arterial but raised the venous pressure. These effects were probably induced indirectly through action on the heart. Morphine and the nitrites lowered venous pressure, apparently by direct action on the venomotor mechanism.

The therapeutic possibilities of **Digitalis** are becoming more and more clearly defined. An important research by Cushny, Marris, and Silberberg[31] shows that it slows the pulse in some cases by a vago-inhibitory effect on the whole heart, but that in others the retardation which it produces is unchanged by atropine, and is therefore due, not to action through the vagus, but is a direct effect on the conducting fibres which pass from the sino-auricular node to the auricle and from the auricle to the ventricle. In auricular fibrillation (*q.v.*) its action is also direct; probably it is exerted through an augmentation of the contractile power of the heart and a consequent improvement in the myocardial nutrition. These findings apply, not to digitalis only, but also to its near relatives, strophanthus and squill. Eggleston[32] shows by clinical observation that the emetic effect of digitalis is due to its action, after absorption, on the bulbar centres, and not in any way to gastric irritation. From these data he makes the very important deduction that, "inasmuch as it has been shown that all true digitalis bodies produce nausea and vomiting by direct central action, it is fallacious and wholly irrational to seek to avoid these symptoms resulting from the oral administration of any given preparation by resort to another preparation or to another channel of administration." He points out that any causation of gastric symptoms which may follow a change of method is probably due to the fact that the second preparation or mode of administration is less favourable to rapid absorption of the drug. [The writer has applied Eggleston's hypothesis in the use of digitalis, and finds that it may be given with benefit in the vomiting of auricular fibrillation.—C. C.]

Bernoulli[33] has tested the action of digitalis on persons subjected to graduated muscular exercise, and finds that it has no influence on the cardiac reaction to strain. From this he argues that digitalis does not produce any appreciable tonic effect on healthy muscle, and that it is useless to give it for any purpose if the heart be thoroughly compensated. This is in accord with Mackenzie's teaching, to the effect that auricular fibrillation (*q.v.*) is the great indication for its use. At the International Congress,[34] Windle said he had found the drug almost as useful in rheumatic heart disease with regular heart action and dropsy—a rare combination; and Cushing and Wenckebach also upheld its value in non-fibrillating cases. In spite of increasing knowledge as to the general action of digitalis and similar drugs we are not yet able to say what happens under their influence inside the myocardial cells. Clark[35] working with **Strophanthin**, comes to the conclusion that it does not enter into combination with the cell protoplasm to any appreciable extent; that it acts specifically on cardiac muscle and not on other tissues; and that its depressant action on conductivity is of a different nature from its tonic action on systole.

To many, the conclusions of Parkinson and Rowlands[36] regarding the action of **Strychnine** on the heart will come as a great surprise. They "found no evidence that the subcutaneous injection of a full dose of strychnine in cases of heart failure with a regular rhythm, produces any change in the blood-pressure, rate of pulse, rate of respiration, or general symptoms within the hour following its administration. In cases with auricular fibrillation strychnine produced no change in the rate or irregularity of the pulse, rate of respiration, or general symptoms during the same period." They conclude, therefore, that strychnine has no effect which justifies its employment as a rapid cardiac stimulant in cases of heart failure.

Allard[37] and Schubert[38] describe their experiences of **Cymarin** as a cardiac tonic. This drug is a pure crystalline glucoside of *Apocynum cannabinum*. The first writer says it is a powerful and rapidly acting cardiac tonic, which may well be employed where digitalis has failed; and that its intensive diuretic effect makes it doubly useful in the presence of cardiac dropsy. It may be given by mouth or intravenously; introduced by the latter avenue it acts in a few minutes. Allard says there is a wide margin between the therapeutic and the toxic dose, so that it is a drug which involves no risk to the patient. Schubert agrees on the whole with these statements but thinks cymarin weaker than digitalis and therefore to be used first, the stronger drug being kept in reserve. Its dosage is more accurate than that of digitalis and sometimes indeed it produces beneficial results where the more powerful drug has failed.

An interesting investigation into the effect of **Strong Purging** in heart disease carried out by Neilson and Hyland[39] shows that with the lowering of the blood-pressure that occurs, the heart is often slowed and its action in some way enfeebled, so that arrhythmia and other symptoms may be induced. In all cases where such methods are used, the blood-pressure must be carefully watched, for those patients who experience most harm from purgation are also those in whom the pressure falls most.

The duty of the physician who must induce **Diuresis** in heart disease is thus summed up by Hirschfelder:[10] (1) Acquisition of knowledge as to the state of the kidneys by every reasonable means, including the newer function tests; (2) Strengthening of the circulation by **Digitalis** or its fellows where this is indicated, or, on the other hand, relief of the cardio-vascular apparatus by a **Karell Diet**; and (3) The use of **Theocin** or the **Saline Diuretics** to relieve œdema if the renal epithelium is not severely injured. Newburgh[11] has attacked the same subject from the standpoint of M. Fischer's belief that accumulation of acid within the tissues is chiefly responsible for the collection of dropsical fluid in cardiac and other diseases; he finds, however, that practice does not confirm this theory, for the administration of alkali with or without sodium chloride did not induce diuresis in cases of cardiac œdema, and in some instances proved actually harmful.

Kaufmann and Popper[12] describe a case of *paroxysmal tachycardia* in which they think the new rhythm originated in the region of the *a-v* node, and was associated with a varying degree of sino-auricular block. By giving **Physostigmine** with **Strophanthus** the rhythm was changed to a totally irregular one presenting all the usual evidences of auricular fibrillation; this again was converted into a regular pulse by substitution of **Atropine.**

The treatment of heart disease during pregnancy came under discussion at the German Congress referred to above.[24] Fromme said that pregnant women with heart disease but no symptoms, need no treatment. Medicinal treatment suffices for those whose symptoms are mild, for primiparæ with severer symptoms but no decompensation preceding pregnancy, and for multiparæ who went through previous pregnancies without disturbance, and who betray no high degree of myocardial disease. Termination of pregnancy may be indicated at any month if the above measures fail, or if symptoms of decompensation return often during the same pregnancy; particularly if severe symptoms have been noted in previous pregnancies. As for breaking of compensation at parturition, it may be mitigated by hastening delivery. Young girls who are subject to severe symptoms of broken compensation should be strongly dissuaded from marriage. With these general statements other speakers were in accord.

The British school of cardiology produces book after book of which it may well be proud. Attention may be drawn here to one just written by John Cowan,[43] of Glasgow, which is particularly adapted for the needs of the practitioner. Its two chief merits are these: that it is written by a man who has examined the subject for himself and who embodies his own personal experience in this book, and that he has maintained his sense of proportion by investigating the subject from every point of view. The result is a handbook in which the new work, relating chiefly to morbid physiology, is correlated with the older anatomical and clinical data; and the dry bones of the latter are endued with the vitality of the former.

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66; [3]*Brit. Jour. Child. Dis.* 1913, 203; [4]*Amer. Jour. Med. Sci.* 1913, ii, 1; [5]*Med. Chron.* 1913, June, 121; [6]*Jahrb. f. Kinderheilk.* 1912, Sept. (*Brit. Med. Jour.* Epit. 1913, i, 38); [7]*Amer. Jour. Med. Sci.* 1913, i, 9; [8]*Presse Méd.* 1913, 100; [9]*Quart. Jour. Med.* 1913, vi, 221; [10]*Ibid.* 453; [11]*Heart*, 1913, iv, 241; [12]*Quart. Jour. Med.* 1913, vi, 441; [13]*Brit. Med. Jour.* 1912, ii, 1769; [14]*Heart*, 1913, iv, 147; [15]*Edin. Med. Jour.* 1913, ii, 124; [16]*Deut. med. Woch.* 1913, 1493; [17]*Lancet*, 1913, i, 1435 and 1513; [18]*Ibid.* ii, 379; [19]*Presse Méd.* 1913, 293; [20]*Deut. med. Woch.* 1913, 1033; [21]*Lancet*, 1913, ii, 457; [22]*Berl. klin. Woch.* 1913, 723; [23]*Amer. Med.* 1913, i, 348; [24]*Berl. klin. Woch.* 1913, 1138; [25]*Brit. Jour. Child. Dis.* 1913, 66; [26]*Brit. Med. Jour.* 1913, ii, 785; [27]*Bost. Med. and Surg. Jour.* 1913, ii, 85; [28]*Presse Méd.* 1913, 365; [29]*Lancet*, 1913, i, 1092; [30]*Jour. Amer. Med. Assoc.* 1913, ii, 388; [31]*Heart*, 1912, iv, 33; [32]*Jour. Amer. Med. Assoc.* 1913, ii, 757; [33]*Münch. med. Woch.* 1913, 967; [34]*Lancet*, 1913, ii, 809; [35]*Brit. Med. Jour.* 1913, ii, 897; [36]*Quart. Jour. Med.* 1913, vii, 42; [37]*Deut. med. Woch.* 1913, 783; [38]*Ibid.* 540; [39]*Jour. Amer. Med. Assoc.* 1913, i, 436; [40]*Ibid.* ii, 340; [41]*Bost. Med. and Surg. Jour.* 1913, ii, 40; [42]*Deut. med. Woch.* 1913, 1822; [43]Diseases of the Heart, Edward Arnold, London, 1913.

HEART, SURGERY OF. (*See also* PERICARDITIS.)

Priestley Leech, M.D., F.R.C.S.

Several papers on the treatment of *wounds of the heart* have appeared during the year. Stewart,[1] of Philadelphia, reports five cases of suture of the heart; two died and three recovered. He has operated on other cases where he felt equally sure a wound of the heart existed, but exploration revealed no such lesion. In each of these cases of mistaken diagnosis the thoracic wall was penetrated over the heart, the patient was profoundly shocked, and there existed a hæmopneumothorax; in two such cases of gunshot wound the pericardium had been grazed and contused, but not penetrated. In another case, the bullet lodged in the pericardium, which contained a few drachms of blood, and the heart was contused. In two cases of stab wound, the knife had passed down between the pericardium and the lung. In two other cases of stab wound of the præcordium, although the general symptoms of shock were pronounced, it was found that the knife had not entered the thoracic cavity.

The heart may be reached by a knife or a bullet which has passed through the skin of the axilla, back, or abdomen. No conclusion as to the existence of a wound of the heart can be drawn from the amount of external bleeding. A knife does not leave a straight track; often the heart is wounded above the level of the skin wound, as the tissues glide and distort the track. In four of the cases there were local signs of hæmopneumothorax, and the area of cardiac dullness was replaced by tympany. In one case, in which the pleura was not injured, the area of cardiac dullness was greatly enlarged. In all cases but one, the heart sounds were faint but distinct, and in none could any adventitious sound referable to the heart be heard. Some of the bizarre bruits described as indicating a wound of the heart may be due to the passage of air through the thoracic wall. Subcutaneous emphysema, noted in four cases, may interfere with satisfactory auscultation. Shock and profound anæmia were present in all the cases. In two instances the patient walked for some distance after the accident. Distention of the veins of the face, neck, and arms, indicating pressure on the auricles as the result of hæmopericardium was present in only one case. This sign, combined with an increase in the area of cardiac dullness, is almost pathognomonic of a wound of the heart: it may follow a wound of the pericardium alone, or a wound of the great vessels within the pericardium.

He makes a chondro-cutaneous flap, the size and shape depending on the situation of the external wound. If the pleura has not been injured, it is of the greatest importance to preserve it intact, and this can best be done by turning the flap to the left. He was never able to see the wound in the heart, because there was copious hæmorrhage before it was discovered by the finger. There are cases on record in which the operator vainly searched for a wound which autopsy afterwards revealed. A continuous suture was used in all cases, and the needle was passed deeply, without reference to systole or diastole. Silk was used in two cases, and in one gave rise to a sinus through which it was discharged; catgut was used in the other three. Once a large branch of the coronary artery was tied, and once the descending branch of the left coronary artery close to its origin, where it had been accidentally wounded by the needle; this case recovered. This artery has been tied four times in the human subject, and only one recovered. This patient dying five years afterwards, it was found that the wall of the left ventricle was the seat of interstitial myocarditis, and in one place near the apex was greatly thinned. He drained the pericardium in one case, and a purulent pericarditis followed. The other four were not drained. He will not drain in future, nor would he drain the pleural cavity (in three cases an empyema developed where this was done). He would employ the Auer-Meltzer insufflation apparatus, clear the blood out of the pleural cavity, and close the thorax completely; or if the insufflation apparatus was not at hand, close the thorax completely, and withdraw the air by an aspirator.

Mitchell[2] reports one, Lucas[3] two successful cases, one of stab wound and one of gunshot wound; he recommends massage of the heart for reviving the heart and drainage of the pericardium. De Verteuil[1] reports two interesting cases of stab wound of the heart. One patient, a boy of 14, was immediately operated on and recovered. In the other case, five days elapsed after the infliction of the wound before operation was undertaken; in this case venous blood filled the pericardium, and the wound of the heart could not be found. He died, and at the autopsy a punctured horizontal valvular wound about half an inch long was found in the right ventricle, half-way between the apex and base of the heart and penetrating into the ventricular cavity. He opened the pleural cavity in both cases, and noticed no aggravation of symptoms. The advantages are freer exposure of the heart and pericardium, thorough examination of the pleural cavity, and removal of clots if any are present. He thinks an ordinary straight incision gives ample room, without making a trap-door as suggested by some authors. He cut away the costal cartilages of the fourth and fifth ribs, and had plenty of space. Holladay[4] reports three cases, with two recoveries. Rehn[6] reviews the surgery of the heart and pericardium. As regards wounds of the heart, he thinks the cases are so urgent that the quickest way to get to the wound is the best.

REFERENCES.—[1] *Ann. Surg.* 1914, ii. 97 ; [2] *Ibid.* i. 206 ; [3] *Deut. med. Woch.* 1913, 1009 ; [4] *Brit. Med. Jour.* 1914, i. 704 ; [5] *N.Y. Med. Jour.* 1913, ii. 189 ; [6] *Berl. klin. Woch.* 1913, 241.

HEART-BLOCK.

Carey Coombs, M.D., M.R.C.P.

From a number of isolated observations of cases of heart-block, the following points of interest have been collected. That heart-block of all grades is commonly associated with lesions of the auriculoventricular bundle is now established firmly ; and several cases during the year go to confirm this (Wardrop Griffith and Kennedy,[1] cardiosclerosis ; Cohn and Lewis,[2] syphilis). The coincidence is by no means invariable, however ; Rénon, Giraudel and Thibaut[3] report a case of heart-block with epileptiform attacks in which a most careful examination of the heart after death failed to disclose any lesion of the bundle or of the nervous system, and similar discrepancies are recorded by Oppenheimer and Williams,[4] and by Rohmer.[5] At present it is not possible to explain such cases as these.

The occurrence of heart-block in association with acute infections is noted by several writers (Rohmer,[5] diphtheria ; Dykes,[6] pneumonia ; Lewis,[7] rheumatic infection, pneumonia, *B. coli* infection). The first of these writers has shown that it is a very exceptional feature, even in a disease which attacks the myocardium so vigorously as does diphtheria ; and the same is probably true of acute rheumatism.[8]

SYMPTOMS.—Several interesting facts have been reported in regard to the *pulse* variations in heart-block. Naish[9] calls attention to the possibility of a relatively rapid idioventricular rhythm ; two patients, whose tracings proved the existence of complete dissociation between auricle and ventricle, had pulses often rising to 50 per minute. The usual rate assumed by the ventricle, when it generates its own rhythm as it does when cut off from the normally controlling auricular rhythm by complete heart-block, lies between 30 and 40 ; so slow a pulse attracts attention, tracings are taken, and the lesion of conductivity stands revealed. But when the pulse-rate is not less than 50, it does not strike the clinician as extraordinarily slow, and in default of tracings the existence of heart-block remains undiscovered. Naish also[10] describes a case in which there was at times a complete dissociation between the auricular and ventricular rhythms, so that the ventricle beat at its own rate ; this idioventricular rhythm was slowed after periods of extrasystolic arrhythmia such as were apt to occur after exercise. In Neuhof's[11] case of complete block the idioventricular rhythm became quickened and irregular after the administration of atropine, and also independently of this ; this alteration being due not to extrasystolic arrhythmia, but possibly to partial decrease in the degree of block by the atropine effect. In a case recorded by the writer,[12] with bouts of complete block, idioventricular rhythm passed within a few seconds into a normal sequence, ventricular following auricular systole at ·2 second intervals; then came a period of normal sequence, followed by a terminal phase of 4 : 1 block. The moral of these and the foregoing pathological observations seems to be that though the main anatomical and physiological facts of heart block have been correlated with as much precision as in the parallel laboratory experiments of Erlanger, there is still a fringe of discrepancies and apparent contradictions which demands further exploration.

By a characteristic aberration in the curve the *electrocardiographic* examination is able to reveal the presence of lesions interrupting one or other of the two chief branches of the *a-v* bundle without injury to the main stem (Lewis[7] Mathewson[10]). At present we know of no other means by which the presence of such a lesion can be discovered.

The fits which may accompany heart-block, the combination of the two phenomena constituting the Stokes-Adams syndrome, are divided by Wilkinson[13] into three grades—the vertiginous, the apoplectiform, and the epileptiform. Dumas[11] points out that slowing of the whole heart may be accompanied by cerebral attacks, and that these may also coincide with long cardiac pauses such as may occur in connection with extrasystolic arrhythmia; the only connection between heart-block and fits is that of temporary cerebral anæmia induced by the former and causing the latter, so that other cardiac irregularities having the same result—cerebral anæmia—are capable of provoking similar fits. At the same time, however, the cerebral attacks of extrasystolic arrhythmia and of slowing of the whole heart are seldom severe, while those caused by heart-block are often grave enough to threaten life.

TREATMENT.—Here there is little to be said as yet. Most of the lesions which have developed far enough to cause heart-block are already out of the reach of therapeutics. Josué and Godlewski,[15] however, claim beneficial results in a case of complete block, following on the prescription of **Graduated Exercise** (walking on the flat and climbing a staircase). They regard this as due to stimulation of the auriculo-ventricular connections through the sympathetic nerve.

REFERENCES.—[1]*Brit. Med. Jour.* 1913, i, 1203; [2]*Heart*, ii, 7; [3]*Presse Méd.* 1913, 65; [4]*Jour. Amer. Med. Assoc.* 1913, i, 1709; [5]*Jahrb. f. Kinderheilk.* xxvi, 391 (*Presse Méd.* 1913, 318); [6]*Lancet*, 1912, ii, 1008; [7]*Brit. Med. Jour.* 1913, i, 484; [8]*Ibid.* 584; [9]*Ibid.* 491; [10]*Quart. Jour. Med.* 1913, Jan. 196; [11]*Amer. Jour. Med. Sci.* 1913, i, 513; [12]*Bristol Med.-Chir. Jour.* 1913, 30; [13]*Birm. Med. Rev.* 1913, i, 183; [14]*Rev. de Méd.* 1913, 148; [15]*Presse Méd.* 1913, 374; [16]*Edin. Med. Jour.* 1913, ii, 233.

HEAT EXHAUSTION.

Herbert French, M.D., F.R.C.P.

The effects of exposure to intense heat during laborious work, e.g. in the stokeholds of steamers at sea in hot climates, forms the subject of a long discussion by Fiske.[1] The symptoms which result are similar to, but not identical with, those of sunstroke, and their pathology is somewhat different in that they are in part due to local dehydration of the muscle tissues, with resultant fibrillary twitching, cramps, and rigors of great severity. There is pallor or lividity, drenching perspiration, weakness of both voluntary and involuntary muscles, the circulatory and respiratory functions being profoundly embarrassed. Sensory-motor phenomena are those of exhaustion rather than of the irritable, responsive to the least stimulation, type; there is the tendency to sleep and stupor rather than to convulsions.

Attacks of this kind are familiar to most ships' doctors who have been engaged in the tropics; and Fiske has analyzed the official reports that have been submitted to the United States Government from time to time about them. Although alcoholism, the drinking of iced water, and other etiological factors have received blame on different occasions, Fiske draws a very definite conclusion that neither the habits of the men, nor the actual temperature of the atmosphere in which they work, are nearly so important as the absence of thorough ventilation; even when the latter can only be carried out with hot air, the fact of there being a free draught in the stokeroom minimises enormously the risk of stokers' cramp and "heat" exhaustion. The paper is one of great importance, not merely to the medical profession, but still more to those concerned with navies and the mercantile marine.

REFERENCE.—[1] *Amer. Jour. Med. Sci.* 1914, i, 295.

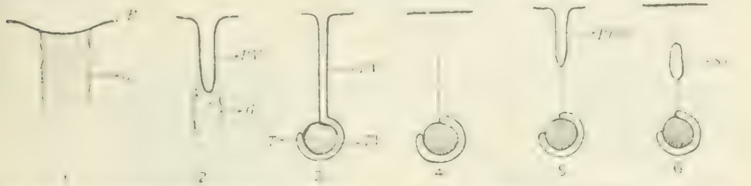
HERNIA. (*See also* INTESTINAL SURGERY.)

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

The occasional occurrence of *cysts* connected with hernial sacs, and the duplication of these sacs, is attributed by Murray[1] to variations in the peritoneal attachment of the gubernaculum, and to anomalies in the obliteration of the processus vaginalis (*Fig.* 32).

Considering the frequency of *hernia in infants*, *strangulation* is comparatively rare. According to Collins[2] it is most frequent during the first three months of life, and becomes less so during later infancy. Special symptoms in children are violent screaming, recurrent vomiting, constipation, tendency to retention of urine, and rapid collapse. Though the sac generally contains small intestine, cæcum and appendix are present more often than in adults. The prognosis is good, provided operation is performed without delay. The exact method of operation matters little, provided it is simple and brief.

Friedman[3] says that in *retrograde incarceration* of the intestine two or sometimes three distinctly separate loops of gut are found in the hernial sac, while the incarcerated loop is within the abdomen near the hernial orifice. The organs involved may be the appendix, Fallopian tube, Meckel's diverticulum, omentum, or intestine, most often small intestine. The condition most often occurs in old-standing inguinal hernia. The connecting loop within the abdomen is apt to suffer from the effects of the constriction more than the two loops in the hernial sac, which may be normal or only moderately strangulated. Given a long-standing, large-sized hernia which has become strangulated, where there is either faint rigidity or a tumour immediately above Poupart's ligament, a diagnosis of hernia "en W" may be made; and when at operation there are present two or three distinct loops of



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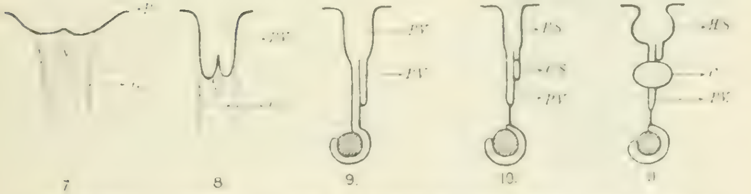

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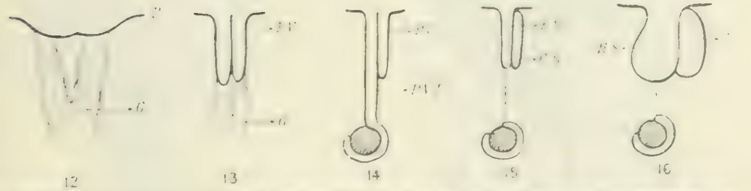

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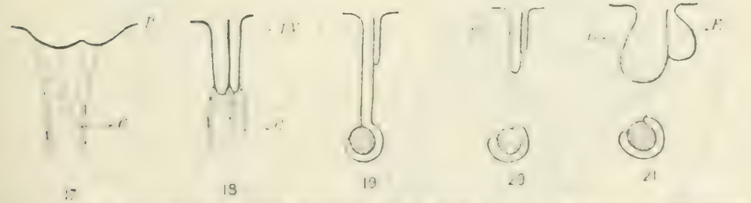


[illegible]

[illegible] Diagrams illustrating the formation of loops in hernial sacs. [illegible]

gut in the sac, with fluid escaping from the abdomen, an incarcerated connecting loop is to be thought of and looked for (*Figs.* 33-37).

Pringle[4] has been disappointed in the results of Mayo's operation for *umbilical hernia*, and has also come to modify the method in a manner which he considers a distinct improvement. A large elliptical area of skin and subcutaneous fat, including the thin skin covering the hernia, is removed. The vertical breadth of skin and fat which is to be removed is gauged by holding up the abdominal wall until the large

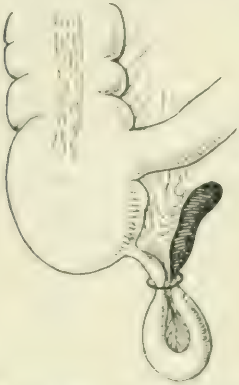


Fig. [illegible].—Retrograde incarceration of appendix.

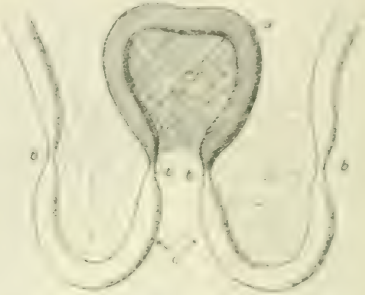


Fig. [illegible].—Retrograde incarceration in hernia [illegible] W [illegible] (a) Abdominal loop; (b) [illegible] loops; (c) loops in sac.

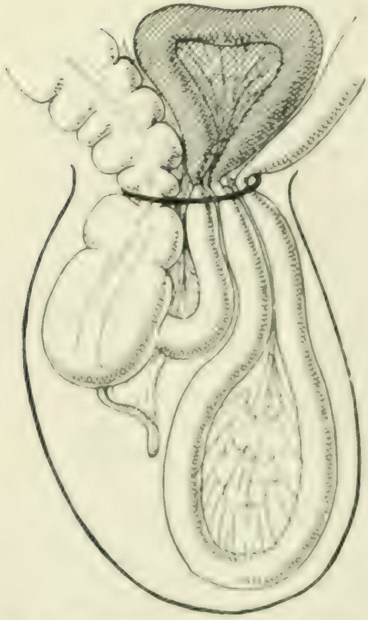


Fig. [illegible].—Hernia [illegible] W [illegible] [illegible]

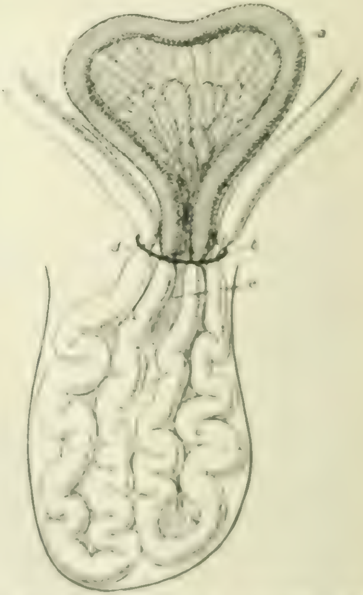


Fig. [illegible].—Diagrammatic [illegible] W [illegible] suprapubic fold of tissue, present in all these patients disappears; the transverse extent of the wound is anything from 10 to 16 in. (*Plate XXI, Fig. B*). The removal of this elliptical area is generally begun from below, and the subcutaneous fat must be removed fairly cleanly from the underlying sheath. The sac is opened to the ring, all its loculi are emptied of their contents, which are returned into the abdomen, and the whole sac is removed. A transverse incision is then made from each lateral margin of the ring to the outer limit of each rectal sheath (*Fig. B*), and the two portions above and below this incision are dissected as two flaps off the anterior surface of the recti muscles, the one upwards, the other downwards, the tissues of the stretched linea also being split horizontally, so as to maintain the halves of the two sheaths in continuity with each other (*Fig. C*). This dissection of the two sheath flaps is to be made upwards and downwards far enough to permit easy approximation of the inner borders of the two recti for the whole distance in which they are exposed. One, two, or three mattress sutures, according to requirements, taking a wide grip, are passed through the two recti, the posterior layer of the sheath, and the peritoneum. These are drawn tight enough to approximate the two muscles, but before they are tied the now bunched-up posterior sheath and peritoneum, as well as the margins of the "ring" opening through these structures, are sutured in a vertical mesial line; the mattress sutures are now tied (*Plate XXII, Fig. D*), and then the two adjacent margins of the recti are also sutured. A series of sutures is next placed to carry and fix the cut border of the inferior flap, made from the anterior sheath of the rectus, as high up behind the upper flap as possible (*Fig. E*); and then the cut border of the upper flap is sutured over and in front of the inferior flap (*Fig. F*) as far down as it will come, so that good and wide overlapping is obtained. The margins of the superficial wound are now approximated. If drainage should be considered necessary, it may be from either angle of the wound, or through a stab wound, in the tissues of the abdominal wall just above the pubes.

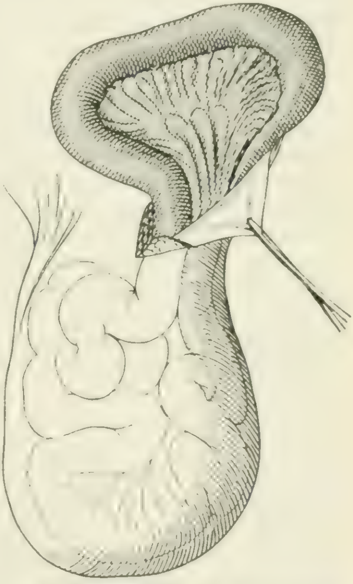


Fig. 3.—Friedman's case of retrograde incarcerated hernia.

REFERENCES.—[1]*Lancet*, 1913, i, 740; [2]*Ann. Surg.* 1913, i, 188; [3]*Surg. Gyn. and Obst.* 1913, ii, 97; [4]*Glasg. Med. Jour.* 1913, i, 103.

HERPES ZOSTER.

E. Graham Little, M.D., F.R.C.P.

PATHOLOGY.—Montgomery and Culver[1] report two interesting cases of herpes zoster, and contrast the symptoms in detail. In the first case the eruption was on the lower third of the left leg, and was preceded by severe neuralgia for about 10 days. The eruption itself was slight, but the pain persisted after the subsidence of the skin lesions. The second case affected the area of the first division of the fifth nerve. This was followed a month later by paralysis of the levator palpebræ, and six months later by glaucoma of the same eye. The authors regard herpes zoster as caused by a centripetal infection, derived from a superficial inoculation of the skin or mucous membrane, and explain the greater severity of the symptoms in the ophthalmic case quoted above as compared with the leg eruption by supposing that the virus has a shorter distance to travel in the first instance, less antitoxin being generated, and the central ganglionic inflammation being therefore greater.

Litchfield[2] regards "acute posterior ganglionitis," which is the anatomical accompaniment of herpes zoster, as analogous to acute anterior poliomyelitis, and dwells upon the likeness in the prodromal period of malaise and illness, the limited course, the occasional epidemic character, evidence of contagion in some cases, and immunity to second attacks. Leucocytosis has been observed in some cases of herpes in the post-eruptive stage. The pain accompanying or preceding herpes zoster may be mistaken for the pain of visceral disease, e.g., pleurisy, pneumonia, renal colic, appendicitis, etc., and careful search for the eruption of herpes should be made in all cases of obscure pain.

TREATMENT.—McNab[3] recommends **Ionic Medication** in the treatment of herpes zoster of the trigeminal, where pain and scarring are usually maximal. The method used was as follows: An electrode attached to the positive pole is prepared of the suitable size, covered with three layers of lint, and soaked in sulphate of quinine solution; a current of 1 to 1½ milliamperes for each square inch of surface of electrode is passed for fifteen to twenty minutes and repeated in seven to ten days. The neuralgia which often persists after herpes may be usefully treated by this means, even though the patient may not come for treatment, as happened in a case detailed by the author, for many weeks after the onset of the disease.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1913, i, 1902; [2]*Ibid.* 1931; [3]*Lancet*, 1913, i, 821.

HIP JOINT, OSTEO-ARTHRITIS OF.

[illegible], M.D., F.R.C.S.

Sampson Handley and Ball[1] describe an operation, which they call **Cheilotomy**, for restoring the movement and function in certain cases of osteo-arthritis of the hip. They report two successful examples. In both, the condition followed an old injury to the hip. The operation consists of opening the hip joint and removing the lipping on the edge of the femur. The restoration of movement, while probably depending mainly upon the removal of actual bony obstacles to rotation and abduction, may also be partly due to restoration of "slack" in the capsule of the joint. The head of the femur is unduly large, and this tightens the capsule; with the removal of some of the bone, the head is lessened, and thus there is more room in the capsule. They consider the method unsuitable where the constitutional or toxic element of osteo-arthritis predominates; these cases they think are best treated by vaccines.

Wheeler, of Dublin,[2] records a similar case operated on three months before Handley's. He first removed "lipping" from the tibia of the left knee-joint, and, as the result was so good, removed some bone from the head of the femur, with an equally satisfactory result. Every form of treatment, including the use of vaccines and serums, had been tried in vain; and Wheeler thinks that the operation need not be confined to so-called "traumatic" cases; the etiology matters little if the pathological changes are the same.

Albee[3] reports 31 cases in which he produced ankylosis of the hip; 20 were arthritis deformans; 9 tuberculosis; 1 an ununited fracture of the neck of the femur; and 1 a "cured" tuberculous hip.

MacKenzie Forbes,[4] of Montreal, in cases of one-sided hip disease of this kind, recommends excision of the anatomical head of the femur, and replacement of the neck into the acetabulum. The limb is kept in extreme abduction for a period of at least six weeks, in an endeavour to form a new fibrous head over the incised neck. The osteophytes round the rim of the acetabulum are also chipped away.

References.—[1]*Brit. Med. Jour.* 1913, i, 929; [2]*Ibid.* 980; [3]*Post Graduate* 1912, xxvii, 1017 (*Surg. Gyn. and Obsts.* 1913, i, 169); [4]*N.Y. Med. Jour.* 1913, ii, 614.

HYDROPHOBIA. (*See* Rabies.)

HYPERTRICHOSIS.

E. Graham Little, M.D., F.R.C.P.

Treatment.—For permanent removal of hair the sole satisfactory method is by **Electrolysis.** For temporary removal Freshwater[1] considers the methods of plucking, shaving, cutting, and singeing, all of which in suitable cases may be recommended. Depilatories have no permanent effect. There are several formulæ, e.g.:—

℞ Pulv. Orpiment. ʒij | Calc. Hydrat. ℥i

or concentrated solution of **Barium Sulphide** made into a paste with starch; or:—

℞ Barii Sulphidi ʒiij | Amyli āā ℥i
Pulv. Zinci Oxidi

The sulphide should be fresh; otherwise its action is unsatisfactory. At the time of application, sufficient water should be added to make a paste, which is then spread over the hairy part and permitted to remain two or three minutes, or until a sensation of heat or burning is felt. It is then quickly removed by scraping with a wooden spatula, and the skin is thoroughly washed with warm water; after drying, the skin should be covered with cold cream.

In prescribing a depilatory the patient should be informed that its action is only temporary, and that it must be repeated after a variable period. Further, when first applied, it should only be allowed to remain on the skin a short time, in order to ascertain the tolerance of the skin to its action, even if the removal of hair is incomplete.

When the hair is very fine, but annoyingly visible, **Bleaching** by **Hydrogen Peroxide** (10 volumes) effects much improvement and is safe. For bleaching the hair on the arms and legs, **Sodium Peroxide Soap** (2½ to 20 per cent), left on the skin for five to twenty-five minutes, is useful. Rubbing the hairy area with **Pumice Stone** is also a useful home method. To commence with, the hair on the chin or lip should be cut short or singed. A piece of pumice-stone without rough edges is selected, the artificial pumice-block being the best for the purpose, and rubbed gently over the part to be treated against the direction of the hair growth, for a few minutes twice a day; the friction should not be so severe as to damage the skin, and afterwards a little cold cream should be rubbed in. This should be carried out for six months, during which time the part will be free from hair. A rest of a month is then enjoined, in order to see the effect produced on the hair growth; in a large number of cases, it will be noticed that the hair growth is weaker, that is, where previously thick pigmented hairs grew, now fine hairs appear. Another six months' rubbing is ordered, and at the end of this period in some cases the hair is practically destroyed, while the rest show a marked diminution in number and size of the hairs. After this, an occasional rubbing will be sufficient to keep the growth invisible. [illegible] expressly cautions against the use of *x*-rays for any exposed area such as the face, owing to the risk of permanent telangiectasis and other disfigurements. A method of punching out hairs with a special machine devised by Kromayer is also described, but it has been little used and is not very practical.

Electrolysis is the method of election, and is thus performed. The patient is placed in a semi-recumbent position and in a good light. The region to be treated should be sponged over with ether to free it from grease. A fine steel needle (No. 12), or platinum or gold needle, fitted to a holder, is sterilized, attached to the negative pole of a battery, and plunged into the follicle; the patient then makes the circuit by grasping the positive electrode. The current should read about 1½ milliampères, and from thirty to forty seconds are required, the end of the reaction desired being marked by frothing in the follicle, when the patient drops the electrode and the needle is withdrawn, and the hair removed by gentle traction with forceps. After each sitting the patient bathes the part with hot water and anoints with cold cream. The scab formed falls off within a few days.

REFERENCE.—¹*Pract.* [illegible]

HYPNOTISM. (See SUGGESTION.)

INFANT FEEDING. *Frederick Langmead, M.D., F.R.C.P.*

All workers among infants, whether medical or lay, are almost daily brought face to face with avoidable suffering and death, due to unnecessary weaning. Much of this is due to ignorance, neglect, and poverty, but much also must be attributed to the irresponsible and light-hearted way in which weaning is advocated by many medical attendants. As Dr. Lucy Naish[1] points out, few medical men appreciate the difficulties attendant on the commencement of lactation, and the mother, lacking intelligent and sympathetic help, often lapses into a course of feeding which would otherwise be avoidable. Few mothers understand that the crying of their babies in the first two days of life is not the cry of hunger. The consequence is that, already exhausted by child-birth, they are worked into a state of anxiety which prevents sleep and affects the mammary functions. Many babies have difficulty in suckling at first, and may show an aversion for one breast, quite apart from any abnormality in the gland. If the position assumed during these early attempts is not comfortable for the mother, she may feel cramped and tired before any proper suckling has taken place. Dr. Naish recommends that the baby be laid across the mother's body and a pillow placed under the arm which supports the child's head.

For *cracked nipples*, she advises avoidance of the commonly-used hardening agents, strict limitation of the time of suckling during the first few days, and the application of bland ointments and fomentations. After-pains induced by suckling are often very intense, and an assurance that this is really beneficial is a great comfort to the mother, and removes one more hindrance to lactation.

When the "draught" appears, there is a sharp cutting pain radiating through both breasts. If the infant elicits the "draught" by mouthing the nipple without firmly catching hold, the breast soon gets soft again, and this is often mistaken by the mother and the nurse for an indication of a poor supply of milk. A mother should be informed beforehand that the breast only secretes while the sucking action is going on, and that if this stimulus is not present, the gland will become softer. The secretion of the breast tends to be periodic, and if the baby is not fed when the flow is active, the milk runs away. This shows that it is best to feed the baby at the optimum time of secretory activity, and is evidence of the value of regularity in breast feedings. During suckling the breast-milk flows much more rapidly during the first few minutes, and as shown by test feeds, the baby will receive during the first three minutes about two-thirds of its average meal. This vigorous flow may irritate the back of the child's throat and cause it to choke, so that it screams and refuses to suck. This may be ascribed by the mother to unsuitability of the milk, and she should be warned of the possibility of its occurrence.

The crying of the baby is often taken as meaning an insufficient supply of milk. The best way of investigating this is by the test feed, weighing the baby before and after on sensitive scales. A fairly adequate estimate, however, may be made by using a pump on the opposite breast while the baby is sucking. Abstraction of the milk by a pump, when the baby is not stimulating the breast, gives an erroneous idea of the amount of milk secreted, and the mother needs very little persuasion that her milk is inadequate for the baby.

Rest and freedom from excitement, which are essential to a suckling mother, are often difficult to obtain because of headache and sleeplessness. Dr. Nash recommends **Phenacetin** and **Caffeine** for the troublesome headache, and **Bromides** at night to enable the mother to sleep. A large number of weanings take place because the mother is not sufficiently shielded from worries during the first few weeks, a truth which furnishes a particular reason for keeping her in bed during this time. Babies are taken off the breast because the mother "cannot stand the strain," but something else should be given up rather than the natural food of the child. This author believes that there are certain times when the milk tends to fail and when weaning is particularly apt to occur. These dangerous times are the ninth day, the third week, the sixth week, and the beginnings of the third and fourth months.

Cran[2] writes of the abuse of the weighing machine in the maternities of France, which he ascribes with Variot to a too rigid adhesion to the rule laid down by Budin, that no more than 100 grams of milk per kilo of the weight of the infant should be given in twenty-four hours if disorders from overfeeding are to be avoided. Variot considers this quantity too small, and favours a daily amount of one-sixth of the body-weight during the first three months. The fear of overfeeding has led to many instances of underfeeding, the symptoms of which are not generally recognized. The child shows signs of hunger, and is shrivelled and wasted. Vomiting and diarrhœa occur, contrary to what might have been expected, and these gastro-intestinal symptoms disappear when the proper quantity of food is given. Fear of overfeeding has also led to suckling at one breast at a meal, which may be very right in the first few weeks, if the milk flow is abundant, but if persisted in in all cases beyond the first two months of life, will often prove fatal. Cran's contention is that the baby's stomach cannot be treated as though it is a test-tube, that the child on the breast can suck until its appetite is appeased, and that if the child and mother are healthy, frequent weighings do more harm than good. Once or twice a week is enough.

Forsyth[3] has made a continuous estimate of the consumption of breast milk by an infant of the better class from the fifth day after birth until the forty-ninth day. Considerable daily variations were observed, a difference of as much as 60 per cent occurring in the fourth week, but despite these, gain in weight was continuous. The amount of individual feeds was found to be equally variable, and the same breast, after approximately equal periods of rest, yielded very unequal quantities of milk. These observations show the uselessness of attempting to estimate the amount of milk yielded daily by multiplying the amount taken at one test feed by the number of daily feeds.

PLATE XXIII

BRENNEMANN: EXPERIMENTS ON CURD FORMATION

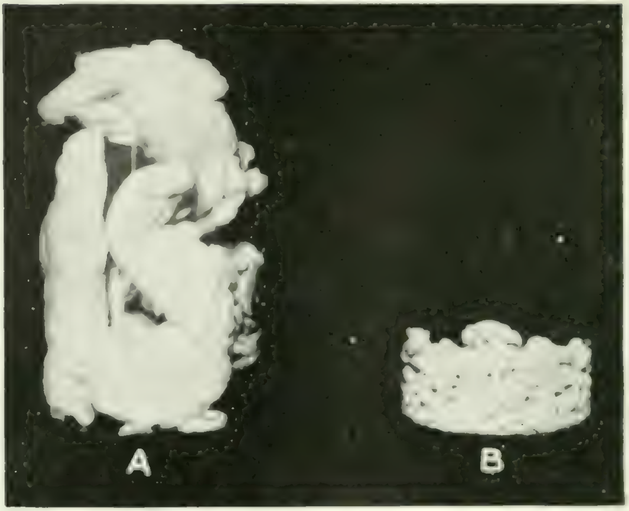


Fig. 1. A [illegible] B [illegible]

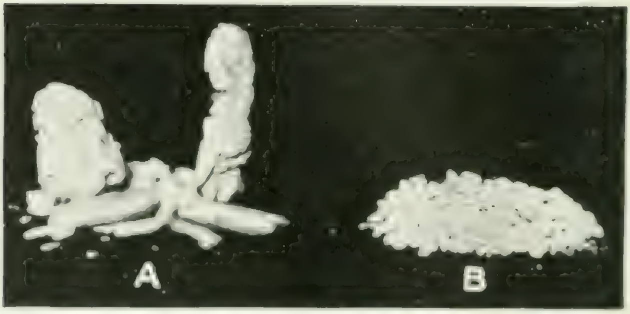


Fig. 2. A [illegible] B [illegible]

[illegible]

[illegible]

Eustace Smith[4] formulates three simple rules for the artificial feeding of infants. (1) "Take care that the infant is bathed as quickly as possible in hot water, and that its feet and legs are never allowed to get cold." (2) "See that a sufficient variety of flavour is contained in the several meals." (Two differently tasting foods may be given alternately in the day and a third at night; in exceptional cases, a greater variety is required). (3) "See that the feeding apparatus is absolutely clean, the food fresh, and the sanitary arrangements generally in good order." Milk should be kept outside the living room; cream is only to be used if quite fresh; foods are not to be allowed to stand for hours after being mixed; and highly perishable articles, such as whey and barley-water, must be made fresh as required. Whey is not to be depended upon after four hours, nor barley water after six. The practitioner should personally look into the conditions under which the child is being brought up, and do his best to remedy, without delay, any carelessness or neglect in the nursery. By this means he will be far more likely to bring about the result he desires than by any ingenuity he may show in devising a food, or care in prescribing the exact proportions of casein, sugar, and cream to be allotted to the several meals.

The relative value of *boiled* and *unboiled milk* is still a bone of contention. Morse[5] details the changes produced in milk by heat and the conflicting views held as to the relative advantages of raw, pasteurized, and sterilized milks. The disturbances which the cooking of milk may cause are slight and insignificant in comparison with the diseases caused by infected milk. He advises that all milk, except the cleanest, should be cooked before being used as a food for infants. Lane-Claypon, as the result of a careful study of the available data bearing on the question, sums up by saying that such small differences as have been found in the nutritive value of raw and boiled milk, have been in favour of boiled milk." Brennemann[6] has performed a series of experiments which show that both *in vitro* and *in vivo*, when rennin is added to raw milk, the milk will quickly form a dense, hard coagulum, which rapidly and completely separates from the whey. Boiled milk under the same conditions coagulates more slowly, separates less completely, and forms a soft, finely divisible curd which differs but little from a thick liquid (*see Plate XXIII*). Although not advocating the exclusive use of either, he considers that the casein of raw milk, unless modified so that it will not form hard, large coagula, offers serious difficulties in digestion that are not present in boiled milk.

Morse favours **Pasteurization**, holding that whilst it is somewhat problematical how much influence the changes in milk induced by heat have on the development and well-being of the infant, it is wise to avoid them as far as is consistent with the destruction of pathogenic micro-organisms. He recommends heating the milk at 60° C. for twenty minutes, for at this temperature there is no change in the taste, odour, or colour of the milk, and no noteworthy alteration in its chemical composition. The ferments and bactericidal action are unaffected, whilst bacterial toxins and non-spore-bearing micro-organisms are destroyed.

Pfender[7] believes clean and raw cow's milk, modified to the requirements of the infant, to be the best artificial food, but has found pasteurization at 65° C. for twenty or thirty minutes more satisfactory in actual practice. He, however, records a case of infantile scurvy in an infant fed in this way.

The writer[8] has contributed a paper concerning his further experience in the use of **Whole Citrated Milk,** first suggested by Sir Almroth Wright. The sodium citrate is prescribed most satisfactorily in the form of a solution, and added to the milk in the proportion of 2 grains to the ounce. Either before or after its addition, the milk is brought to the boil, for this enhances the effect of the citrate and renders the non-spore-bearing micro-organisms innocuous. Healthy babies may be fed on citrated whole milk from as early as a fortnight after birth, and do not require feeding more often than every three hours by day and once nightly. The surest guides to the amounts required are the baby's appetite, the weight chart, the state of the motions, and the general progress. The advantages of whole citrated milk are the small volume of the feed, the simplicity of its preparation, the little manipulation required, and the absence of the need for adding cream, a substance which is expensive, variable in its constitution, often rich in micro-organisms, and in the summer months dosed with preservatives. After watching some hundreds of babies fed in this way, the writer is convinced of its value, the failures being surprisingly few. Rickets, gastric dilatation, general hypotonia, and the puffy and pasty appearance so commonly seen in babies fed on diluted milk, do not develop. The muscles are particularly strong and firm. Another occasion for citrated milk is at the time of weaning. Eighty consecutive marasmic infants were fed in this way, and their progress noted by frequent weighings. All gained in weight, a result which was very satisfactory, since previously all were wasting, and on very many kinds of food. One died of epidemic diarrhœa and vomiting, and five developed diarrhœa and vomiting in the summer months from which they recovered, but apart from this no serious gastro-intestinal disturbance occurred.

The school of Finkelstein and Meyer continues to attract many adherents. According to Morse,[9] these authors believe that the diarrhœal diseases of infancy originate in a functional weakness of the intestine, that this weakness is kept up and increased by fermentation, of which sugar is the special and primary cause. The fat is never at fault primarily; it is injurious in that it causes an acid fermentation. The fermentation of sugar is dependent on the concentration of the whey, and the relative proportions of casein and sugar in the mixture. They conclude, therefore, that the principles governing the preparation of a food to combat intestinal fermentation are: a diminution in the quantity of milk sugar and of salts by dilution of the whey; and an increase in the casein, with varying and, under certain circumstances, not inconsiderable amounts of fat. They consequently developed a food to meet these indications which is known as "**Eiweissmilch**" (method of preparation described in the MEDICAL ANNUAL 1912). It is prepared with precipitated casein and buttermilk and is afterwards boiled. Its composition is: Fat 2·5 per cent, lactose 1·5 per cent, proteid 3 per cent, salts 0·5 per cent. They claim that with this mixture the loose green stools are quickly changed. It is, however, insufficiently nutritious, and they advocate, therefore the addition of malt sugar or dextrin-maltose preparations after the acute symptoms are over, holding that maltose, on account of the rapidity of its absorption, does not cause a recurrence of the excessive fermentation.

Morse points out that by using mixtures of precipitated casein (prepared by Finkelstein and Meyer's method), water, and cream, it is possible to obtain any desired percentage of fat and casein, with very low percentages of lactose and salts. He has used this method in many cases, and is convinced that there is a variety of intestinal indigestion in infancy which is relieved by reducing the sugar and salts, and by giving large amounts of casein, and that the dextrin-maltose preparations can be given to those patients sooner than lactose without causing a return of the symptoms. This type of intestinal indigestion may be either acute or chronic, and is characterized by frequent loose stools, green in colour, often frothy, acid in reaction, and not infrequently containing mucus and fat curds. Unfortunately, precisely similar stools may be due to bacterial infection, in which this form of treatment may do material harm. He prefers lactose to maltose for feeding normal infants. He considers that maltose is contraindicated in the treatment of diarrhœa due to the gas bacillus and similar organisms, and is less useful than lactose in that caused by the dysentery bacillus.

Neff[10] has employed with success milk prepared by Finkelstein's method, but in which the whey elements have been increased beyond those of "Eiweiss" milk. This has been attained by using buttermilk only as the diluent for the curds, instead of half buttermilk and half water.

Chapin[11] believes that the best method of preparing an artificial food for infants is to use as a basis, milk or top milk diluted with **Cereal Gruels** of definite strength for their mechanical effect on the curd of the milk, and then, by altering the character of the carbohydrates, adapt them to the energy and digestive requirements of the individual infant. The method consists in using gruels made from various cereals as a starting-point, and then by means of diastase converting the starch into soluble starch, dextrin, or maltose as may be required. The extent of conversion of the starch is regulated by the digestive power and needs of the infant. A nearly complete conversion into maltose is indicated when rapid assimilation is required. To obtain the maximum amount of maltose, the conversion should take place at about 150° F. but when soluble starch and dextrins are indicated the temperature should be at about 165° F.

Proprietary Foods are only advisable under certain special conditions, and should not be used as a routine in feeding normal infants. However, as H. C. Cameron[12] shows, by an intelligent use of them much can be accomplished. He divides them into seven classes: (1) Condensed milk with a high percentage of added cane sugar; (2) condensed milk without added sugar; (3) dried milks; (4) dried milks with added malted sugar; (5) pure malted sugar; (6) foods consisting almost entirely of unaltered starch; (7) foods consisting of mixtures of unaltered starch and malted sugar. According to this author, the infant with green watery stools, vomiting, colic, ulceration of the buttocks, and a slightly raised irregular temperature, benefits almost always by a change to a whole-milk diet. Such infants are commonly fed on proprietary foods containing an excess of sugar or starch, or upon a milk mixture to which large amounts of cane sugar have been added. Infants who cannot digest the fat of cow's milk suffer from profuse vomiting, often of curdled milk, and are either constipated or pass bulky, white, greasy, and foul-smelling stools. A change to a fat-poor, sugar-rich diet usually causes the symptoms to cease at once. Certain babies fed on cow's milk, although they are free from diarrhœa and vomiting, remain small and ill-developed. They are pale, flabby, and constipated. The stools are large, bulky, and pale, or hard and pellet-like, and are always alkaline to litmus. In such cases the addition of carbohydrate produces immediate improvement. In young infants showing this condition, the use of a malted sugar or of dried milk with added malt is indicated. At six months one or more feeds made with the addition of some starch-containing food may be advisable. After six months it is often found that infants who react to increase in the amount of sugar by developing diarrhœa will tolerate starchy forms of carbohydrate well. **Extract of Malt** agrees well with the milk-fed baby, but aggravates the disturbances of sugar-fed children, whilst **Cod-liver Oil** has properties just the reverse.

REFERENCES.—[1]*Lancet*, 1913, i, 1057; [2]*Ibid.* 1056; [3]*Ibid.* 1056; [4]*Brit. Med. Jour.* 1913, i, 1267; [5]*Jour. Amer. Med. Assoc.* 1913, i, 825; [6]*Ibid.* 478; [7]*Med. Rec.* 1913, i, 764; [8]*Amer. Med.* 1913, i, 200; [9]*Amer. Jour. Med. Sci.* 1913, ii, 640; [10]*Jour. Amer. Med. Assoc.* 1913, ii, 1223; [11]*Ibid.* 1221; [12]*Brit. Med. Jour.* 1913, i, 873.

INTERMITTENT LIMP. (See ARTERIOSCLEROSIS.)

INTESTINAL SURGERY. (*See also* ABDOMEN, GUNSHOT WOUNDS OF; DIVERTICULITIS; HERNIA; VISCEROPTOSIS.)

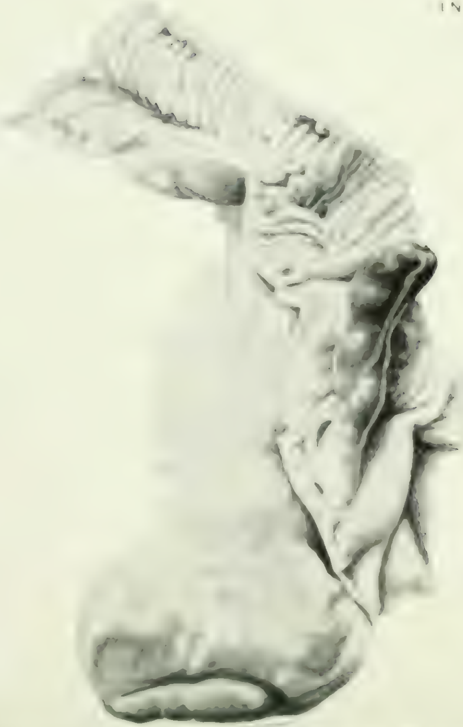
Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

An encouraging case is recorded by Dowd,[1] who successfully resected about a third of the colon for irreducible *intussusception* thirty-seven hours after the onset of symptoms, in an infant five days old. The cut ends of the colon were invaginated and united by side-to-side anastomosis. At the time of the report the wound was healing satisfactorily. He was able to collect only six cases of recovery after resection in infants less than one year old.

In an interesting paper on the surgical aspects of *Meckel's diverticulum*, Drummond[2] records 22 cases of acute abdominal disease caused

PLATE XXII.

INTESTINAL SURGERY



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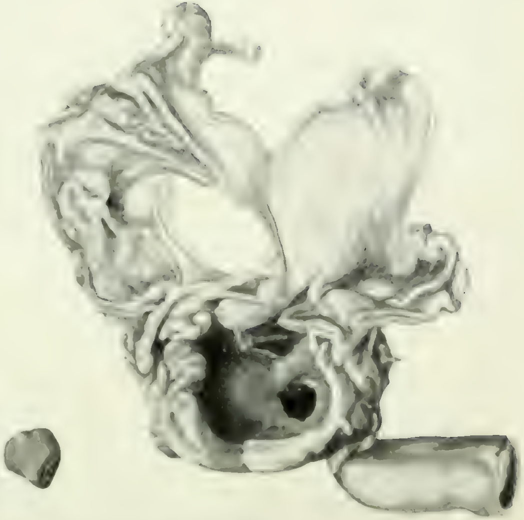

[illegible]

by diverticula, occurring in twelve years in the Royal Victoria Infirmary, Newcastle. These illustrate the majority of the dangers to which this remnant may give rise (*Plate XXIV*). In 7 cases, an inverted diverticulum had produced intussusception of the small intestine; in 14 cases, acute intestinal obstruction resulted, in 5 of which it acted as a band over which a coil of intestine was looped; in 1 case, gangrene of the diverticulum only was recorded. Drummond thinks that as a rule, a certain type of diverticulum is responsible for a certain type of lesion: an unusually long one will cause intestinal obstruction, and may become inflamed or strangulated from interference with its blood-supply; one adherent to the umbilicus may cause strangulation or produce a secondary volvulus; while small, cone-shaped diverticula are liable to become inverted into the bowel and cause intussusception.

It is difficult to distinguish the symptoms of acute diverticulitis from those of appendicitis, though intestinal obstruction is more common in the former, where it is, indeed, frequently the primary lesion. A typical case of *diverticulitis of the sigmoid* is recorded by Eisenberg,[3] who has collected 50 cases of a like nature from the literature. His patient was a man of 45, suffering from constipation, with the passage of blood and mucus in the stools. Recently he had had pain in the left iliac fossa, and vomiting and rigors. There had also been a rapid loss of weight. In the left iliac fossa a flat tumour could be felt. It was rather fixed, and seemed adherent to the abdominal wall. The sigmoidoscope showed nothing abnormal. Operation was undertaken upon a diagnosis of carcinoma of the colon. On opening the abdomen, a tumour of the sigmoid was found, adherent to the parietes and the bladder; this was resected and the ends of the bowel were anastomosed. Recovery followed. Examination of the specimen showed that the tumour was due to inflammatory reaction around diverticula.

The *late results of short-circuiting the large intestine* are studied in an interesting paper by von Beck,[4] whose results may be summarized as follows: 10 cases of cancer of the large bowel died from four to twelve months later; of 10 cases of extensive ileo-cæcal tuberculosis, 3 died of phthisis three to six and eight years later, while 7 are well from four to ten years later; 32 cases were operated on for colitis or pericolitis, 6 of whom had a recurrence of pain after the operation, a fæcal accumulation being found in 2 of these at a second operation in the excluded loop of large bowel. He concludes that entero-anastomosis is well suited to the treatment of ileo-cæcal tuberculosis. The results of short-circuiting the large bowel in nervous women are not satisfactory.

According to McGavin,[5] *transverse colostomy* possesses distinct advantages over the usual iliac route as the operation of election, viz.:

(1) Good sphincter control. The transverse colostomy eliminates the factor of gravity, which in the iliac operation is constantly tending to force the fæces through the opening. It also allows an effective artificial substitute for the natural sphincter.

(2) Firm support for belt and plug. A belt in this position is secure and does not tend to ride upwards. A greater pressure of the belt can be supported here where the recti are at their strongest and are backed by a strong aponeurotic sheath.

(3) Freedom from prolapse.

(4) Accessibility. With an opening in the transverse colon it is easy for the patient to lean forward over a receptacle while sitting down, and the position is conveniently placed for cleansing.

(5) Good spur formation is possible owing to the length of the mesocolon.

(6) In cases of temporary colostomy the reconstitution of the bowel is effected far more easily when the opening is made in the transverse colon.

In this connection it is of interest to read Keen's[illegible] description of the details of a satisfactory dressing devised by a patient who has had an *inguinal colostomy* for twenty years. The bowel ends normally protrude about half an inch outside the abdomen. By suitable attention to diet the bowels should be regulated to act every morning; the motions are never under control as with a normal sphincter, but they always give fair warning.

The details of the protective dressing are most important, for this must take the place of the normal sphincteric control. The patient lying on his back with a many-tailed bandage spread out beneath him, a piece of cotton-wool is first wrapped round the bowel ends. A layer of wool, 8 in. by 11 in., is then laid over the abdomen, reinforced at the bottom by another piece 3 in. wide. This is to afford better support for the flange of the truss and to increase absorption. Over this pad is laid a smaller piece of linen, then another sheet of wool—split thin—and finally another square of linen covered with a piece of rubber cloth 5 by 6 in. square. These pads are arranged so as to extend more fully to the side and below the colostomy opening than in the opposite directions. The many-tailed bandage is then fastened up, beginning with the lowest lap, and secured with safety pins; its perineal ends are then drawn up and pinned. The pads should project about half an inch below the lowest lap of the bandage. Next, standing up, the patient adjusts his truss. This constricts the lower edge of the bandage, holding it tightly to the groin and making the bandage and pads a safe reservoir even with liquid discharges, if they are not too profuse.

Barth[illegible] records a rare case of *incarceration of part of the colon in the lesser sac*, occurring in a man aged 4[illegible] who was suddenly seized with very acute pain in the right half of the abdomen, mainly above the umbilicus, and vomiting. The pain was paroxysmal in nature, each attack being worse than the preceding one. He had not passed flatus or faeces for thirty-six hours. When seen, he was in great agony, sweating and crying for relief. The whole of the right side of the abdomen was retracted and rigid; the upper part of the left abdomen was also rigid, but less so. No swelling could be felt in the abdomen. The man was thought to be suffering from acute appendicitis with perforation, and operation was at once proceeded with. Incision over the right iliac fossa revealed no evidence of peritonitis; the cæcum and ascending colon could not be found. Through a median incision above the umbilicus, a tense swelling was discovered just to the right of the mid-line, beneath the edge of the liver, and between it and the stomach. This was at first thought to be an inflamed gall-bladder, but eventually it proved to be a portion of the ascending colon which had made its way into the foramen of Winslow, followed by the whole of the cæcum, and had then ruptured the gastro-hepatic omentum, so that it lay under the parietal peritoneum. It was tightly incarcerated, and in a few more hours must have been strangulated. After it had been emptied of gas, Back was able to reduce the hernia and restore the cæcum to its normal position. The patient made a good recovery.

REFERENCES.—[1]*Ann. Surg.* 1913, i, 713; [2]*Surg. Gyn. and Obst.* 1913, i, 656; [3]*Beitr. z. klin. Chir.* 1913, 627; [4]*Ibid.* 330; [5]*Brit. Med. Jour.* 1913, i, 680; [6]*Jour. Amer. Med. Assoc.* 1913, i, 1419; [7]*Lancet,* 1913, ii, 17.

INTESTINAL ULCERATION IN CHILDHOOD.

Frederick Langmead, M.D., F.R.C.P.

Simple *ulcer of the duodenum* is usually regarded as one of the rarest of diseases in children. Moynihan, however, was able to collect sixteen cases from the literature. Such ulcers have been known to be occasionally present in melæna neonatorum, and have been thought by some to be the source of the bleeding, but by the majority to be a secondary result of hæmorrhage into or beneath the mucous membrane. Walther Schmidt[1] states that duodenal ulceration in the first year of life is commoner than is generally believed, and indeed is most frequent at this period. He bases his opinion on the results of 3824 consecutive autopsies. He found that 1·8 per cent of children who died in the first year of life showed this condition.

Sidney Phillips[2] has described a fatal case of *widespread ulceration limited to the small intestine*, in a boy, aged 10. The patient had severe abdominal pain, with periods of quiescence, for some four months. The abdomen was tumid and tender. At the beginning of the illness some vomiting occurred, but this soon ceased. There was no diarrhœa, nor was blood or mucus passed by the bowel. The temperature did not rise above 99·2° F. At the post-mortem it was seen that the small intestine for about its middle third was of a deep red colour, and there was a good deal of hæmorrhage into the mesentery. There was no thrombosis of the mesenteric vessels. Within the intestine it was seen that large irregular areas were entirely denuded of mucous membrane, the submucous and muscular coats being exposed. A few defined shallow ulcers were found. The large bowel was quite healthy. The condition exactly resembled that found in the large intestine in cases of acute ulcerative colitis. The explanation of the case was obscure, and he had been unable to find a similar one in the literature. The writer,[3] in the discussion which followed, recorded a case very like the above. It was that of a boy, aged 9, who died from uræmia, which was associated with abdominal distention and tenderness, and diarrhœa. The last part of the small intestine was very engorged and almost denuded of mucous membrane. The case differed in that an intoxication—that of uræmia—was the direct cause of death.

REFERENCES.—[1]*Brit. Med. Jour.* 1913, i, 503; [2]*Brit. Jour. Child. Dis.* 1913, 154; [3]*Proc. Roy. Soc. Med.* vi, 1912, 14.

IRIS, CILIARY BODY, AND CHOROID, DISEASES OF. (*See also* MEDICAL ANNUAL, 1912, 298.)

A. Hugh Thompson, M.D.

ETIOLOGY.—These three structures, forming as they do the vascular coat of the eyeball, are collectively known as the uveal tract. Inflammations affecting either one of them are apt to spread to the other two, and have therefore in recent years been classed together and termed *uveitis*. Three well-recognized causes of uveitis have long been known, the first of them common, the other two rare: *syphilis*, *tubercle*, and *sympathetic infection*. Besides these cases a large number occur, the causation of which has been until recently, and, indeed, still is, more or less obscure. Important discussions on these cases have recently taken place at the Liverpool (1912) meeting of the British Medical Association; in connection with the series of discussions on alimentary toxæmia at the Royal Society of Medicine (1913); and at the London meeting of the International Medical Congress (1913). The following are among the more practical outcomes:—

1. Acute rheumatism is not a cause of iritis or uveitis. It is true that ten years ago Poynton and Paine brought forward some experimental evidence to the contrary, but this was admittedly extremely inconclusive. As for any clinical evidence, as was pointed out by Ormond,[1] iritis undoubtedly occurs occasionally in those who have had acute rheumatism at some previous date, but with two such common diseases it has yet to be shown that the connection is anything more than accidental.

2. *Gonorrhœa* is a very common cause of iritis. According to Lang,[2] these cases generally occur in men where there is an infection of the prostate arising from an uncured urethritis, which may linger for years after the original infection.

3. Apart from syphilis and tubercle, by far the most common cause of iritis, cyclitis, and choroiditis is *septic absorption*. To this many of the cases formerly termed rheumatic are due, and it is this which accounts for the connection which undoubtedly exists in some cases between iritis and rheumatoid arthritis, the latter also being due to the common cause. Among the channels of septic absorption, the mouth takes the first place. According to Lang, whose views on this subject have been obtaining more general acceptance for many years past, the most common source of infection of the uveal tract is *pyorrhœa alveolaris*. Out of 215 cases occurring in his private practice, in which sepsis was diagnosed as the cause of ocular disease, in as many as 130 in

source was put down as pyorrhœa alveolaris, the next most common cause being infection from the large gut, which accounted for 33 cases. According to Lang, even mild cases of pyorrhœa alveolaris can cause central choroiditis. "Until the medical profession at large recognize the importance of pyorrhœa and the gravity of leaving it untreated, one cannot reasonably expect the dental branch of the profession to do so either, especially as they are being taught to treat the mouth in a way that makes it impossible to avoid creating sepsis by putting on crowns and building bars and bridges that cannot be kept clean. Until this policy is reversed, and everything is done to enable the mouth to be kept aseptic, loss of sight, and even total blindness, due to pyorrhœa, will continue to occur." Many cases of pyorrhœa no doubt go on for years without any general septic infection resulting, because of the protecting barrier by means of which the tissues are able to localize the bacterial action. "When this barrier has broken down, and the eyes are affected by a serious inflammation which may destroy the sight, it is too late to do anything except remove the teeth at once. Before the extraction, the gums should be carefully cleaned and treated with antiseptics. By doing so the amount of septic material that enters the system through the large raw unprotected tooth sockets is greatly reduced. Failing this precaution, the eye frequently becomes worse immediately after the extractions. If the sight is to be restored in a recent case of central choroiditis, the affected teeth must come out on the chance that they are the cause, and if the inflammation does not subside, then other possible causes must be investigated." (For examples, see a paper by B. T. Lang.[3])

4. There is some difference of opinion as to whether these cases are due to the actual presence of micro-organisms in the eyeball, or merely to their toxins. Fuchs says, "In most cases, and especially in the lighter ones, we have to do probably with the effect of toxins, while some of the more serious cases are perhaps of a parasitic nature."[4] Ormond, on the other hand, doubts whether toxins alone are capable of producing a localized inflammation of the uvea, and attributes all serious cases to the direct action of micro-organisms.[5]

Elschnig, of Prague, believes firmly in the importance of *auto-intoxication resulting from septic absorption from the intestinal tract* as a cause of uveitis, and relies largely on the presence of indican in the urine as evidence of its existence; but others consider that the importance of this index has been over-rated. De Schweinitz[6] maintains that more important evidence can be obtained by estimating the total percentage of ammonia output. In summing up the matter, he says, "There is satisfactory evidence, clinical and bacteriological, that the majority of cases of uveitis (iridocyclitis) are caused by micro-organisms or their toxins. In this respect (omitting cases of syphilis, tubercle, and sympathetic disease) the gonococcus and the staphylococcus are most conspicuous. Other bacterial elements may doubtless play a similar rôle." . . . "The primary source of infection from which the staphylococcus proceeds and reaches the uveal tract, there to create an inflammation, in all probability,[4] is most frequently a chronic septic process in the mouth (pyorrhœa alveolaris), tonsils, nasopharynx, accessory nasal sinuses, uterine cavity, skin (boils, furuncles, etc.),[6] and gastro-intestinal tract.

TREATMENT.—The main point is to remove the source of septic absorption, whether situated in the mouth, bowel, or elsewhere; but an important secondary measure is the employment of **Vaccines.** Browning[7] advocates the bacterial examination of the fæces in difficult cases of iridocyclitis. In one instance he prepared a nearly pure culture of pneumococcus from the fæces of a patient. A vaccine was prepared and the patient treated with it. The improvement was immediate. The constipation, however, from which the patient was suffering was treated at the same time. In another severe case of a patient who had had dysentery two years previously, an organism was found in the fæces which proved to be a type of Flexner's dysentery bacillus. After the seventh injection of a vaccine made from it, the eye which was least affected was reported to be well, but the case subsequently relapsed.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, ii, 1020; [2]*Proc. Roy. Soc. Med.* vi, No. 7, Supplement, 401; [3]*Brit. Med. Jour.* 1913, i, 381; [4]*XVIIth Internat. Congr. Med.* Sect. ix, Pt. 1, 5; [5]*Brit. Med. Jour.* 1912, ii, 1020; [6]*XVIIth Internat. Congr. Med.* Sect. ix, Pt. 1, 41; [7]*Proc. Roy. Soc. Med.* vi, No. 7, Supplement, 120.

ISCHÆMIC MYOSITIS. (*See* MYOSITIS.)

JAUNDICE IN CHILDREN. *Frederick Langmead, M.D., F.R.C.P.*

"Catarrhal" jaundice in children, as in adults, has usually been attributed to gastro-duodenal catarrh, chill, or "immoderate indulgence at table." Several epidemics, however, have been recorded, more especially in recent years, which seem to denote that it may be infectious in nature. Leonard Guthrie[1] describes a small outbreak in a limited district in West London. Ten cases were seen in November and December, 1911, and January, 1912; the children's ages varied between three and eleven years. In three instances more than one member of the same family were affected, and seven of the patients were related as brothers and sisters.

The jaundice was deep in all cases, and associated with clay-coloured stools and bilirubinuria. The average duration was three to four weeks, but in one case it lasted only a week. It was ushered in by malaise, languor, and sometimes drowsiness; the temperature was usually raised slightly. Anorexia was the rule, but in one case the appetite was said to be voracious. Vomiting occurred in two cases, with diarrhœa in one and constipation in another. In one case complaint was made of itching. Bradycardia was not observed in any case. The liver was enlarged in six, and greatly so in four, extending nearly to the umbilicus; when bile appeared in the stools it slowly subsided, and became normal in size in from one to two weeks. The intervals which elapsed between the onset of jaundice in different members of the same family could not always be determined accurately. None of the patients were seriously ill at any time.

As Guthrie insists, it is important to distinguish between epidemic "catarrhal" jaundice and the epidemic infectious jaundice usually known as Weil's disease. Icterus in the latter is associated with urticaria, petechiae, hæmorrhages from the nose, stomach, and elsewhere, fever, enlargement of the spleen, nausea, vomiting, diarrhœa and albuminuria. Nervous symptoms, like those of acute yellow atrophy, may end the scene. Relapses are common, and in some cases a remarkable urinary crisis attended by polyuria and excessive excretion of urea takes place on the seventh or ninth day. Post mortem, the changes are those of acute yellow atrophy of the liver, or extreme fatty degeneration, with diffuse hepatitis and leucocytic infiltration near the portal spaces. It is essentially a filth disease, and is chiefly confined to the districts round the Mediterranean Sea. Guthrie thinks it probable that epidemic jaundice, whether in the severe form known as Weil's disease or in its milder form called catarrhal jaundice, epidemic or sporadic, consists of examples of acute diffuse hepatitis produced by organisms or toxins which may not be the same in all cases. Blockage of the main duct may be secondary to hepatitis, descending and not ascending the duct. The epidemics, although mild in character hitherto, may at any time become more formidable.

Herrman[2] gives an account of a very similar condition, which he styles "acute infectious jaundice." His report is based on 68 cases, 25 of which were seen during October, November, and December, 1912, and January, 1913. No patient was under one year old, and most were between three and six. Over half were seen in the last three months of the year. There was no evidence that the disease was due to digestive disturbances. The symptoms were very similar to those in Guthrie's series, and, like that observer, he found a slow pulse in none of his cases. The liver was palpably enlarged in 21 and normal in only 4 of the last 25 cases examined. It diminished in size with the decrease in the jaundice, but was still palpable when this had disappeared. He adds one sign not recorded by Guthrie. The spleen was palpable in 10 patients, not so in 15. It returned to its normal size more quickly than the liver. All recovered, except one, who developed symptoms resembling those of Weil's disease, and died.

TREATMENT.—Herrman says that in many cases it is only necessary to **Restrict the Amount of Fat in the Diet.** Soup, lean meat, vegetables, skimmed milk, and bread may be given. Acting on the assumption that the taking of food empties the gall-bladder, he recommends frequent small meals. He gives five or six small meals a day, the two or three additional ones consisting of a sandwich and a glass of skimmed milk.

REFERENCES.—[1]*Proc. Roy. Soc. Med.* (*Child. Sect.*), 1912, Dec. [2]*N. Y. Med. Jour.* 1913, ii, 200.

KERATODERMIA BLENNORRHAGICA. *J. Graham Little, M.D., F.R.C.P.*

The first case of this rare condition to be reported in America is contributed by Simpson,[1] who adds a convenient collection of the other recorded cases. His patient, a man aged 28, had had gonorrhœal urethritis two years previously, with subsequent polyarthritis. Six months later a rash developed which became very chronic. It consisted of two types of lesion: a crusted or scab-like brown "rupial" or conical mass which could be removed, leaving a smooth, pink, slightly moist surface without ulceration; these were distributed on the legs, forehead, hands, and fingers. The second type of lesion was a varioliform pustule found chiefly on the wrists, internal malleoli, and soles. The skin on the palms and the plantar surface of the feet was enormously thickened; the nails on fingers and toes were thickened, showing a yellow discoloration, and were finally shed. Numerous horn-like crusts were found on the scalp and on the internal borders of the feet. The pustular lesions developed into the horn-like crusts, which remained unchanged and, if removed, formed again.

Histological examination of a lesion from the leg showed marked epithelial hypertrophy, inflammatory (polynuclear) infiltration of the corium, with some plasma cells, and hyaline changes in the connective tissue. Repeated attempts to obtain gonococci from the blood and the fluid in the joints failed. The urethral discharge finally became free from gonococci also. The patient remained bedridden in spite of energetic treatment with Bier's method, serums, vaccines, etc.; the skin improved with the use of **Sulphur** and **Resorcin** ointment, but the patient committed suicide. Bacteriological examination of fluids removed from the prostate, seminal vesicles, and ankle-joint showed no organisms.

Another case, reported by Swift[2] in a man aged 35, is probably the first case to be met with in Australia. The description and behaviour of the eruption reads very like the case reported above. Gonococci were present in the urethral discharge during the appearance of the eruption, but no organism could be identified in the scales of the cutaneous lesion or in the blood. The arthritis proved extremely intractable, but the skin improved with **Formaldehyde Baths**.

REFERENCES.—[1] *Jour. Amer. Med. Assoc.* 1912, ii, 607; [2] *Austral. Med. Gaz.* 1912, ii, 491.

KERATOSIS FOLLICULARIS (Darier's Disease).

J. Graham Little, M.D., F.R.C.P.

Mook[1] reports four new cases occurring almost simultaneously in his practice—probably a unique experience. The first patient, a male white, aged 35, showed the characteristic eruption at the age of eight years; this spread in adult life to cover the head, face, neck, and trunk, arms, and forearms. There were granulomatous masses in the perineum. The palms were thickened. There was general severe pruritus. The second, a male white, aged 18 years, had had the eruption for thirteen years after an attack of measles. Eventually, the upper two-thirds of the body were affected. The palms were thickened. In the third, a male white, aged 21, the eruption appeared in early infancy, and persisted through life until the upper half of the body was invaded. The fourth patient was a male white, aged 24. The eruption had appeared ten years previously, and when seen, the upper half of the body was involved. In all the cases treatment by **X-rays** produced great improvement. Histological details of the four cases are added and bear out the diagnosis.

Trimble[2] has a singular series of five cases in one family. An American woman, aged 63, was the first patient. She had had the disease for twenty-five years, the scalp, forehead, temples, and legs being the chief sites of the eruption; there was much plantar hyperkeratosis. She had three children, all of whom had the disease in typical form; they were respectively a daughter, aged 41, and two sons, aged 38 and 36. The daughter had a son, aged 14, who showed early but definite signs of the disease. Histological examinations were made, and the typical "round bodies," formerly classed as psorosperms by Darier, were identified. Diseased tissue was inoculated into the peritoneum of a guinea-pig, a portion of diseased skin was grafted into the skin of a guinea-pig, and the contents of diseased follicles inoculated into a rabbit: in all cases with negative results. Cultural experiments with various media gave an anaerobic growth on glucose agar with two varieties of bacilli, one possibly *B. acne*. The other remained unidentified.

REFERENCES.—[1] *Jour. Cut. Dis.* 1912, 722; [2] *Jour. Amer. Med. Assoc.* 1912, p. 664.

KIDNEY, SURGERY OF. (*See also* PYELITIS IN CHILDREN.)

J. W. Thomson Walker, M.B., F.R.C.S.

Congenital Anomalies.—In an exhaustive article on the *dystopic kidney* S. C. Plumer[1] records a personal case and adds 16 communicated ones, which, with 67 collected by Sträker in 1906, make a total of 84 clinical cases reviewed in his article. A dystopic or congenitally displaced kidney is one which is abnormally situated in the body, never having occupied its normal position. This differentiates it from a movable or floating kidney, where the organ has become displaced from its normal position. In dystopic kidney, the vascular supply is abnormal, because it has adapted itself to the abnormal location of the kidney. The shape is usually modified by its position on the promontory of the sacrum, the sacro-iliac joint, or linea innominata, causing a depression on its posterior surface. Furrows caused by vessels are also found, and persistence of fœtal lobulation has been noted. The origin of the vessels is always from a point lower than the normal, namely, the lower part of the aorta, the common or internal iliac, the middle sacral, or the inferior mesenteric artery. The ureter is usually shorter, but the ureteric orifices are normally placed in the bladder, even in crossed dystopia. The side affected in Sträker's cases was: right, 19; left, 34; both, 2; supernumerary, 2. Defects in the genital organs, the bladder, and the rectum, are frequently noted and, if unilateral, occur on the same side as the misplaced kidney.

The kidney is usually normal, but may be the seat of hydronephrosis, pyonephrosis, calculus, sarcoma, tuberculosis, and cystic degeneration. Common symptoms are pain in the lower abdomen, back, loins, buttocks, and lower limbs, a feeling of weight in the lower abdomen, and, in the female, pain at the periods and on coitus. Constipation may result from pressure on the rectum, or enuresis and vesical tenesmus may predominate. The symptoms due to a pathological condition of the displaced kidney are those special to each disease. In favourable cases the diagnosis may be made by palpation of a normally-shaped dystopic kidney. Failure to find a kidney in the normal position is of no great value, and the finding of both kidneys in the normal position does not exclude the possibility of a dystopic supernumerary kidney. Catheterization of the ureters may show a considerable difference in the lengths of the two ureters. Valuable information may be obtained by the use of x rays to show the shadow of the kidney, and with an opaque bougie in the ureters to show these tubes. Munro found pulsation of the trigone due to an underlying renal artery.

The treatment of normal dystopic kidney is summed up as follows: No operative interference unless the symptoms are of considerable severity. If an ovarian cyst or a pyosalpinx is present, this is removed, leaving the kidney. If operation on the kidney is required, **Dislocation** and **Reimplantation** in a part where it is not a mechanical hindrance should be selected. Where nephrectomy is not inevitable from the first, the kidney tissue and vessels should be carefully preserved. In a normal dystopic kidney, ventral laparotomy is the best method of operative approach. In parturition, delivery, although often prolonged and difficult, can take place in the majority of cases without operative interference.

Straker summarizes the management of dystopic kidney in *pregnancy and parturition* as follows. If discovered at the beginning of pregnancy: laparotomy, dislocation, fixation. If discovered later: consider the advisability of the induction of premature labour. A normal dystopic kidney should not be removed shortly before or during labour. If discovered during labour, a pathological kidney may be punctured to allow delivery; nephrectomy to be done after the puerperium. If during parturition delivery cannot take place without injury to mother and child, in case of a dead child perform craniotomy, etc., in case of a living child Cæsarean section, or an operation to widen the pelvis.

Charles H. Mayo[2] discusses the surgery of *single and horseshoe kidney*. In 50 cases of gross renal and ureteral anomalies observed during five years in the Mayo clinic, 7 were found incident to other abdominal operations. Among the total number were 12 of the horseshoe type and 6 of the congenitally single or asymmetrical type. During this period 630 operations were made on kidneys and ureters. There was an average of one serious anomaly associated with the disease in every 20 cases, thus showing that such anomalies are often the cause of, or a contributing factor to, disease of the kidney. A heavy band of renal tissue forming a horseshoe kidney gives rise to pain in the abdomen and lumbar region and beneath the epigastrium. The pains, which radiate downwards, are present when the patient is upright, and disappear on resting. These patients suffer severely from jarring and on muscular effort. Throbbing and a sense of pressure in the abdomen may occur, and on bending backward the discomfort is greatly increased. Such kidneys are more liable to injury, compression of the abdominal vessels may occur, and a case of thrombosis of the iliac and femoral veins causing œdema of the legs and ascites is reported by Neufville. In the diagnosis of horseshoe kidney the associated anomalies of the genital system should be noted. Pyelography is of great assistance, and is more accurate than the opaque ureteral catheter. In every case where the diagnosis is not certain, the other kidney should be explored, usually through a separate incision, before removal of a tumour or a diseased kidney; and in abdominal surgery in which tumours of unknown type and origin are discovered, regardless of location, the kidneys should be palpated before the removal of the tumour.

An account of a *dumb-bell kidney*, a rare variety of horseshoe kidney, found on attempting nephrectomy on a cadaver, is given by Herman and Fetterolt.[3] The specimen consisted of two lateral masses of kidney substance with a connecting bar of the same tissue. The malformed kidney occupied the normal renal position. There were seven renal arteries, four from the aorta, one from each common iliac artery, and one from the left spermatic artery. The renal veins numbered three on each side.

Movable Kidney.—C. MacLaurin[4] formulates the following conclusions. Nephroptosis is almost always congenital, and is comparatively rarely associated with general splanchnoptosis. The right kidney is more or less movable in a large percentage of women. Nephroptosis is liable to be followed by appendicitis, which is found in about one-third of cases of movable kidney. "This in turn may lead to pelvic trouble and gastric ulcer or chronic dyspepsia." The symptoms are due to dragging of the kidney, to torsion of the pedicle, or to resulting appendicitis. Nervous symptoms are probably the result of continued dyspepsia, pain, and discomfort. General splanchnoptosis does not require operation. All cases of abnormal mobility of the kidney with this exception will probably require **Nephropexy** sooner or later. Appendicectomy should be done in every case. Pyuria and albuminuria do not contraindicate operation, but render it imperative. The best operation is the shelf method. The author has performed it in sixty-seven cases with no mortality, and he does not know of any case of relapse.

A. Werelius[5] describes a "basket-handle" operation for nephroptosis. The capsule is split along the convex border, and stripped halfway from the anterior and posterior surfaces. The posterior free flap of capsule is detached above and laterally, leaving only its attachment to the lower pole, and the anterior flap of capsule is treated similarly and left attached to the upper pole. These "suspensory ligaments" are drawn "through the muscles and fascia on either side of the wound." The ends of the "ligaments" are tied in a knot and transfixed by a silk or catgut suture. The united flaps thus form a "basket handle" by which the kidney is suspended.

J. Lacy Firth[6] advocates the method of nephropexy used by Billington, and warns against the danger of injuring the pleura. One advantage of this method is that the kidney is fixed at a normal level. The writer admits, however, that he has only seen one case where trouble was due to too low fixation, and of this case he says: "I cannot be at all certain that this patient's pain was due to the low position of the kidney." The following are the steps of the operation: Oblique incision commencing over the eleventh intercostal space; separation of the fat and perinephritic fascia, dislocation of the kidney, and separation of all adhesions and fat; deflection of a flap of renal capsule downwards from the upper half of the kidney, two-thirds of the flap being from the posterior surface, and one-third from the anterior; insertion of two supporting subcapsular sutures into the lower half of the kidney, the ends of these being sufficiently long to pass through the muscles and skin above the wound, and to be tied over gauze rolls; passage of a curved Spencer Wells' forceps through the eleventh intercostal space at the edge of the erector spinæ, drawing the capsular flap through the opening above the twelfth rib, turning it down, and suturing it to the unstripped surface of the kidney at the lower border of the last rib.

The method did not originate with Billington. "Methods and principles suggested by Edebohls, Fullerton, Goelet, and Frodel have been combined in the operation, and the combination of methods adopted seems to have been first used by Jordan Lloyd." The most serious drawback to this operation according to Firth, is the danger of wounding the pleura. In ten cases this accident occurred once, and was followed by pneumothorax with serious symptoms but ultimate recovery.

Nephrolithiasis.—F. S. Watson[7] discusses the reports of 100 cases of renal calculi, 10 cases of ureteral calculi, and 10 cases simulating renal calculi. In really expert hands, he considers radiography a very certain diagnostic test. In any but the hands of the best experts it is unreliable. In the 10 cases which closely simulated renal calculus, but where calculus was absent, the conditions present were as follows: displaced kidney constricted by bands of adhesions, presence of adhesions in a normally placed kidney, movable kidney not detected prior to operation, distention of the renal pelvis due to misplaced ureteral outlet, acute congestion of the kidney, constriction of the ureter due to adhesions. In one case no cause could be found in the kidney. The dangers of leaving a stone in the kidney are destruction of the renal tissue by pressure, tendency to infection from the presence of the stone, and, in bilateral calculi, the occurrence of obstructive anuria. As a rule, anuria occurs from the blocking of one kidney where the other is absent or seriously diseased. In a small number of cases there is a kidney on the unobstructed side which has "a useful degree of functional capability if it can be restored to its previous activity." When this is the case, the suspension of the function of the second kidney is due to reflex inhibition from blocking of the opposite ureter.

In the treatment of *renal colic* the author considers that it is better to abolish the pain by means of the combined use of **Ether** and **Morphia**, than by morphia alone. Doses of morphia, he says, which are sufficiently large to control a severe attack of renal colic "are likely to prove poisonous if the pain—as it so often does—suddenly ceases." On the other hand, if ether is given to the point of primary anaesthesia, and at the height of the spasms of pain only, neither the drug nor the anaesthetic is harmful or dangerous. Thus, of morphia, $\frac{1}{6}$ gr. subcutaneously is usually sufficient when primary anaesthesia is given in the worst times of the pain. With a view to causing expulsion of the stone, the writer recommends the administration of **Spirits of Turpentine** in 10 min. doses in capsule, and the patient is put on a milk diet with fish and dry toast once daily. Each tumbler of milk should be diluted one-quarter part with Vals water; the milk should be swallowed slowly, and should be slightly warmed. Turpentine should be given for six days, then omitted for two days, and resumed for six days more, if required. The patient is directed to drink a large quantity of water during the treatment, and is kept entirely quiet during each course of six days. In suitable cases, the treatment was successful in about 87 per cent. The average length of time before the calculus was passed in the successful cases was eleven days.

In discussing the surgical treatment of *calculous anuria*, the author holds that simultaneous **Bilateral Nephrolithotomy** should be performed when there are calculi in both kidneys. When dealing with unilateral renal calculus, and the kidney exposed is found to contain no calculus, but to be diseased, so that it is judged that its function alone would be insufficient to sustain life, the surgeon should at once cut down and remove the stone from the second kidney.

In an interesting article on **Pyelotomy** for stone, Eisendrath[5] gives the following notes in regard to the rôle played by the *x*-rays. If the patient has been thoroughly prepared, and the plates are examined by one accustomed to interpret them, one can determine with more than a fair degree of accuracy the position of shadows with reference to whether they are in the renal pelvis or parenchyma. A shadow located on a level with, and close to, the transverse process of either the first or second lumbar vertebra, is due, as a rule, to a calculus located at the junction of the ureter with the renal pelvis. Such a shadow may be triangular or round, or may show a downward and inward projection. Zuckerkandl has recently directed attention to the characteristic nipple-like appearance of shadows at the ureteropelvic junction. When a shadow of this shape and location is present, one can usually say in advance that the calculus can be removed by pyelotomy. When the kidney lies unusually low or high, however, the shadow may be due to a calculus in the upper or lower half of the renal pelvis respectively. In the absence of other complications, pyelotomy can be considered as the ideal method for calculi at the ureteropelvic junction.

When the shadow is further out from the ends of the transverse processes of the first or second lumbar vertebra, the calculus usually lies in a dilated renal calix or in the renal parenchyma. If the shadows are multiple and close together, the stones are probably in the renal pelvis or in a dilated calyx readily reached through a pyelotomy incision. When the shadow is single and a little further out than where the ureteropelvic junction calculi are seen, the calculus is usually free in the renal pelvis or lodged in a primary or secondary calix, and easily reached through a pyelotomy incision. When the shadow is large and triangular or coral-like, or there are a number of shadows distributed over a wide area, one of two conditions is usually found at operation: either the renal pelvis is greatly dilated and filled by a large calculus, or multiple shadows signify considerable distention of the renal parenchyma. With such x-ray findings, pyelotomy can scarcely be considered.

In regard to the technique of pyelotomy, the author notes that it must be possible either to lay the kidney completely on its anterior surface on the skin edges of the incision, or at least to gain access to the posterior aspect of the renal pelvis without much tension on the renal vessels. If the pedicle is short, or there is much fixation of the kidney by adhesions, pyelotomy is out of the question, and too much traction under such conditions would surely result in disaster. In the majority of cases, however, pyelotomy is possible if the incision is not too small and the wound edges are well retracted. That accidents can occur when a calculus is firmly impacted in a calyx is shown by a case of the author's in which severe hæmorrhage followed extraction of such a calculus, and necessitated nephrectomy. The hæmorrhage was found to proceed from a vein just outside the renal pelvis in close contact with the calculus.

Two cases of *nephrolithotomy in young children* are recorded and discussed by R. Ollerenshaw.[9] Renal pain in children is referred to the abdomen, and so ascribed to gastro-intestinal disturbance. The pain may also be referred to the hip or spine, and simulate disease in these regions. It is frequently referred to the groin, and is accompanied by retraction of the testicle more often in boys than in men. Calculi may cause no symptoms in children. Hæmaturia is the most constant and reliable symptom. Nocturnal incontinence sometimes results from fine uric acid sand.

Daniel Eisendrath[10] states that *bilateral urinary calculi* usually produce one of the following clinical pictures: (1) The ordinary calculus (ureteral or renal) symptoms are present on *one* side, but radiographs show calculi on both sides. (2) Pain or other symptoms are manifest alternately on one side or the other, and radiographs show calculi on both sides. (3) There are definite symptoms of calculus simultaneously on both sides (comparatively rare). (4) The case is seen either during an attack of calculous anuria, or giving the history of transitory attacks of anuria with calculus symptoms in the intervals. The well known clinical fact that the pain may be referred to the side opposite to the renal calculi must be remembered in the first three groups. For practical purposes the author divides cases of bilateral calculi into those presenting the familiar symptoms of renal or ureteral calculi, and those seen during an attack of calculous anuria. The majority of surgeons do not agree with the view of Kummell, that anuria is rarely due to reflex inhibition of one kidney when the opposite ureter is blocked with calculus. Calculous anuria is more likely to develop in cases of bilateral calculi than in unilateral cases, and there is a greater tendency for bilateral calculi to recover after removal.

The question of **Operation** varies according to whether the patient is seen during an attack of anuria or not. When anuria is not present, there is considerable difference of opinion as to whether the calculi should be removed at one sitting or at intervals of four or six weeks. The majority of surgeons believe that it is best to operate upon the worst side first, and then to operate on the other side six or eight weeks later. The worst side is determined by ureteral catheterization and the functional tests. The author holds that the calculi should be removed from both kidneys at one sitting under certain conditions. He operates first on the side that gave the last symptoms. If this kidney is found to be insufficient to maintain life, the second kidney is operated on at once; if, however, the first kidney is in good condition, he operates on the second side after an interval. "The question of nephrectomy," Eisendrath says, "depends entirely upon whether the opposite kidney is functionally incapacitated or not, and whether its ureter is likely to be blocked or not, following the removal of the worst kidney." In calculous anuria the side chosen should be that on which there is an enlarged tender kidney, and if the calculus of this side appears to be the cause of the anuria, further operation on the second kidney should be deferred to a later time. If, however, the first kidney is found to be widely destroyed, it is best to operate on the second kidney at once.

Renal Tuberculosis.—At the Medical Society of London, Ralph Thompson[11] made a communication based upon 13,005 autopsies, 8218 on males and 5287 on females, at three London hospitals. Solitary kidney occurred in 1 in 587 autopsies. In ascending inflammation of the kidneys, the disease was bilateral in 135 and unilateral in 38. A series of cases was related where there was evidence of tuberculous peritonitis and abdominal lymphadenitis leading to pressure on the ureters. Sufficient attention had not been paid to constriction of the ureters by fibrous bands formed as a result of tuberculous peritonitis. In tuberculosis of the kidney, the author found that the unilateral cases of post-mortem renal tuberculosis were as 37 to 74 bilateral. In the unilateral cases, the right was affected in the proportion of 13 to 5 on the left. The explanation of the greater frequency with which the right side was affected was to be found in the arrangement of the blood-vessels, the anatomy of the colon, and the normal anatomical obstruction which might be present to the flow of urine along the ureter.

Discussing this communication, Thomson Walker referred to statistics relating to the unilateral or bilateral distribution of tuberculosis of the kidney. Post-mortem records had the great disadvantage that they referred only to the final stage of the disease, and in this stage tuberculosis was bilateral in from 35 to 60 per cent of cases. The surgeon was concerned with ante-mortem pathology, and here tuberculosis of the kidney was unilateral in from 88 to 92 per cent of cases that came under observation. The only reliable method of diagnosis of the unilateral distribution was the ureteral catheter. In cases where the bladder was diseased and it was impossible for an experienced cystoscopist to catheterize the ureters, a course of tuberculin sometimes caused improvement in the bladder condition, enabling the examination to be carried out. Where this failed, the bladder might be opened suprapubically and the ureters catheterized, but this was not an easy proceeding when the bladder was tuberculous. The most satisfactory method in such a difficulty was to expose the supposed healthy kidney and examine it by nephrotomy, and at a later date to operate on the diseased kidney.

Tumours.—R. H. Jocelyn Swan[12] describes a case where a large hypernephroma of the right kidney could not be felt owing to the fact that the anterior border of the liver descended to a hand's breadth below the costal margin. On operation, it was found that the renal growth had pushed the liver forwards and downwards, rotating it upon a horizontal axis. The points of difference in the symptoms of hypernephroma and other tumours of the kidney were as follows: Hypernephroma is most common between the ages of fifty and seventy, and is of comparatively slow growth. Sarcoma is more common in childhood, and forms a rapidly growing tumour with early cachexia. Carcinoma is a disease of later life, and gives rise to more pain and usually to constant hæmaturia, whereas in sarcoma hæmaturia may be absent, and in hypernephroma is usually of an intermittent type. Glandular enlargement is more common in carcinoma, either about the kidney or in distant glands, whereas a pulmonary or osseous deposit is more usual with hypernephroma. Carcinoma and sarcoma tend to infiltrate the surrounding tissues more rapidly than hypernephroma, so that the resulting tumour of the kidney may be more fixed. Embryonic growths are more common in early life and usually form a rapidly growing tumour of the kidney. Pain and hæmaturia are infrequent, but a marked feature of these growths is to cause symptoms by pressure upon other organs. Thus œdema of the legs, or even ascites, with enlargement of the superficial abdominal veins, jaundice, or dyspnœa may be present. With tumours of the renal pelvis, hæmaturia is marked. The symptoms may be spread over a number of years in the papillomatous growths. The renal tumour may vary in size if the ureter becomes blocked by growth or clot. Cystoscopic examination may reveal small secondary villous tufts in the bladder near the ureteric orifice.

Early Hydronephrosis.—H. Cabot[13] regards the following two causes as standing out pre-eminently in the production of this condition: (1) Mobility of the kidney without corresponding mobility of the upper portion of the ureter; (2) Abnormal renal vessels passing to the lower pole of the kidney. The symptoms in early cases are divided into three groups: those suggesting stone in the kidney, attacks of renal colic, a few blood corpuscles and a trace of albumin in the urine; similar symptoms, but without abnormality in the urine; and those resembling acute infection of the kidney, but with a persistently sterile urine. Catheterization of the ureter, with distention of the renal pelvis, gives some help, but is only reliable when there is considerable dilatation, and fails to reveal the cases with an irritable and therefore apparently contracted pelvis. By itself, x-ray examination has only a negative value in excluding renal calculus and helping to exclude renal tuberculosis. Pyelography is the mainstay of diagnosis (*see* MEDICAL ANNUAL, 1912, p. 363).

Acute Hæmatogenous Infection of the Kidney.—Lucius W. Hotchkiss[14] records two cases of excision of an infarct. At operation the kidney was found to contain a triangular area of soft white infarction apparently riddled with minute abscesses. As the rest of the organ appeared healthy, and the infected portion of the cortex was easily enucleable with the finger, the infarct was extirpated in this manner. There was little bleeding. In one case the edges of the gap were brought together by means of catgut sutures, and in the other by gauze pads placed above and below the organ. The operation, the author believes, has a limited sphere of usefulness.

Operations on the Kidney.—Baldwin and Baldwin[15] have in ten years performed nephrectomy 67 times, with a mortality of 25 per cent. There were 34 nephrectomies for tuberculosis, with a primary mortality of 20 per cent; only 6 of the survivors have died since. The authors hold that nephrectomy with complete recovery "does not greatly shorten the expectancy of life." Nephropexy was performed in 61 cases; late results were given in 54 of these, with complete success in 45, great improvement in 4, and complete failure in 5. The Baldwin operation was used, two flaps of the kidney capsule being stitched to a column of muscle derived usually from the edge of the quadratus lumborum. Decapsulation of the kidney for chronic nephritis, "in the only case where it was given a fair trial, proved a brilliant success; in four other last-resort cases it failed to do any permanent good, although it did not hurry the demise."

Andrew Fullerton[16] discusses a series of 48 cases of nephrectomy with 4 deaths. The fatal results were due to sepsis, shock, and anuria. He insists upon the necessity for accurate diagnosis before any operation on the kidney is undertaken. In one case of calculous disease the author removed the only functionating kidney. The patient died of anuria on the ninth day after the operation. The second kidney was a large cyst which did not communicate with the ureter. This result would have been avoided had the ureters been catheterized previous to operation. A case is quoted to show that the painful kidney may not be the one at fault. The author strongly deprecates the removal of a kidney which is bleeding if no obvious disease can be found in it on exploration. The mortality of nephrectomy has diminished in recent years owing to the more efficient means of early diagnosis, and especially to the more accurate information obtainable by means of the ureteral catheter. In most cases of unilateral disease of the kidneys, the urine of the affected side will be found to have a diminished specific gravity. In advanced cases ropes of inspissated pus or blood may replace the fluid efflux. It is not good surgery to remove a diseased kidney until satisfactory evidence has been obtained as to the functional capacity of its fellow. If the urine of the presumably sound kidney has a specific gravity of 1015 or over, is passed in sufficient quantity, and is free from albumin, pus, and blood, it is reasonably safe to remove the affected organ. A trace of albumin, or a few pus- or blood-cells in the urine from the presumably sound side, provided the specific gravity is not too low, need not necessarily preclude operation, other conditions being favourable. The accidents that are liable to occur during the operation of lumbar nephrectomy are, hæmorrhage from difficulty in securing the pedicle, or from injury to the vena cava, injury to the pleura or peritoneum, interference with the blood-supply of the colon leading later to fæcal fistula, and laceration or complete removal of the suprarenal body when adherent to the kidney.

In the MEDICAL ANNUAL of 1912 reference was made to the investigations of Moore and Corbett in regard to the damage done to the kidney by operations. In a further contribution these authors[17] submit some interesting points in regard to several methods of suturing the kidney. The damage done by incision and that done by subsequent suture comprise two distinct types of trauma. In the first class are lesions resulting from the anæmia produced by section of the blood-vessels. These consist of small anæmic infarcts, the shape and size depending upon the distribution of the severed blood-vessels. The damage done by the suture is usually much more extensive and very much more erratic, and may vary from a very little scar tissue to the late destruction of the entire kidney. One of the unfortunate results of applying ligatures is the strangulation of small pieces of kidney parenchyma, particularly in the pyramids. Such strangulated material may become calcified, and later on form the basis for a calcium-phosphate stone. The infarcts resulting from a strangulation of tissue undergo cicatrization, and the ultimate scar may be comparatively insignificant. Much of the parenchyma is lost, but it may be restored by compensatory hypertrophy.

Cullen advocated the use of a silver wire to tear through the kidney parenchyma, instead of cutting with a knife. The authors state that this method has not met with the good results in their hands that have been described. The objections they raise to the silver-wire method are: (1) Difficulty in locating the bloodless zone of the kidney;

(2) Danger from hæmorrhage from irregular aberrant vessels; (3) The method necessitates the cutting of a number of collecting tubules and other kidney structures; (4) The wire traumatizes and is difficult to control. With the wire method the infarcts were sometimes very irregular, and in one case nearly one-fifth of the kidney suffered destruction. In experimental work, the method accompanied by the least amount of hæmorrhage and comparatively little post-operative destruction of tissues consisted in clamping the renal vessels with a Carrel soft-jawed forceps, and approximating the renal parenchyma after exploration by through-and-through sutures of very fine silk. Experiments were undertaken to ascertain whether temporary cutting off the blood-supply of the whole kidney by the clamp caused damage. It was found that, after one hour's atresia, degenerative lesions of the epithelium could be found three days later; but these had disappeared entirely at the end of six days.

In an article on *post-operative renal infection*, H. D. Furniss[18] refers to cases in which there has never been any catheterization of the bladder, antecedent cystitis, or previous infection of the urinary system. He holds that renal infections are more apt to occur when there has been some operation on the intestinal canal, or when there is a wound which is contaminated by intestinal contents. He suggests the possibility that the constipation incident to post-operative intestinal peristalsis and the purging used to overcome this, may account for some of these cases. The most common path of infection is by the blood-stream. The late occurrence of the infection, and the fact that most of the patients have had some rise in temperature immediately following operation, lend weight to the theory that the origin of the infection is from thrombi at the seat of the operation.

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KNEE, INJURIES TO. (*See also* FRACTURES.)

Priestley Leech, M.D., F.R.C.S.

Rupture of the Crucial Ligaments. Fracture of the Spine of the Tibia.—R. Jones, of Liverpool, and Alwyn Smith,[1] of Winnipeg, say that fractures of the spine of the tibia are much more frequent than is believed, and often associated with rupture of one or other of the crucial ligaments. Hogarth Pringle thought that excessive traction on the anterior crucial ligament produced fracture of the spine of the tibia; but these authors think that though this is true of some cases, in others the chip of bone detached does not include the area to which the anterior ligament is attached.

The points to remember about the mechanism of the crucial ligaments are as follows: (1) The anterior ligament is tense when the knee is fully extended and prevents the tibia from being displaced forwards on the femur. (2) The posterior ligament is tense in complete flexion and prevents the tibia from being displaced backwards on the femur. (3) Both ligaments check inward rotation of the tibia.

If after an injury to the knee, the tibia can be displaced backwards or forwards, or rotated inwards in the extended position, an injury of one or both crucial ligaments may be diagnosed. If in the extended position the tibia cannot be displaced forwards, the anterior crucial ligament is not ruptured; if in full flexion the tibia cannot be displaced backwards, the posterior crucial ligament is presumably not ruptured. The most constant sign of fracture of the spine of the tibia is an obstruction to full extension; the block feels like a definite bony obstruction, and is quite different from the locking which occurs when a dislocated semilunar cartilage is nipped.

Jones and Smith divide these injuries into three classes.

1. *Avulsion of the Tibial Spine or of its Internal Tubercle* is the only type of fracture of the spine which has been previously described. It is produced by violent traction on the crucial ligaments: a mechanism similar to that which produces their rupture, to cause which great violence is necessary. Rupture of the posterior ligament alone is a rare accident. Pagenstecher describes one case. Firm union of the torn ligaments is usually obtained if the limb is kept at rest for a long period.

2. *Fracture of the External Tubercle of the Tibial Spine* has not been described previously; it has been seen in three of their cases in the last few years, and they do not think it is connected with injury to the crucial ligaments. The fragment of bone broken off is very small, and is not in the region to which either of the ligaments is attached. They believe the tip of the external tubercle is shorn off from behind by the inner sharp margin of the external condyle, either by the femur being forced forwards or the tibia being driven backwards. The height of this spine varies greatly in different individuals, and it is the high one which is liable to this injury. The mechanism of production is the same as that of dislocation of the internal semilunar cartilage.

They describe two cases of

3. *Injury to the Spine combined with Fracture of the Tibial Tuberosities.* In one the external tubercle was fractured as well as the internal tuberosity; in the other case the exact opposite occurred.

TREATMENT.—The authors are very emphatic, and remembering the present views on the surgery of joints their views deserve serious consideration. Injured ligaments require four or five weeks for their repair, and any elongation or laxity which may be allowed to remain means functional disability. For accurate repair of tendon or ligament no strain should be thrown upon them during the period of healing. The practitioner must learn that nothing but temporary stiffness follows even prolonged rest of a joint. There would be few recurring displacements of the semilunars if the first injury were efficiently treated by resting the injured structures, more particularly the internal lateral ligament. The rupture of any ligaments of the knee should be treated by absolute rest until healing is complete, and this particularly applies to the crucial ligaments. In a recent rupture of the crucials, fixation of the knee for three to six months offers the best chance of recovery. In neglected cases, where movement has been allowed early, they also think fixation of the joint should be first tried; it should be continuous, not even a momentary relaxation being allowed. In old cases, the choice should lie between an operation for fixing the crucials, a mechanical support allowing flexion, or arthrodesis of the joint. If suture is performed, the capsule and ligaments should be made tense by reefing, as it is unreasonable to expect imperfectly repaired crucials to bear the great leverage to which they would be subjected in the presence of a lax capsule and lateral ligament.

In fractures of the tibial spine, the knee should be manipulated until full extension is secured; and if there be no sign of laxity of the joint due to injury to the crucials or other ligaments, the fixation need not exceed two months. When full extension is not possible, and disability, whether pain, stiffness, or effusion, exists in addition, operation is to be recommended.

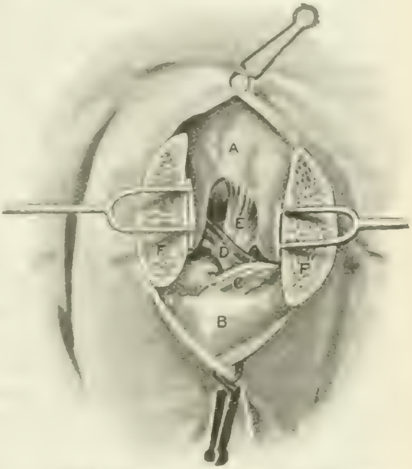

Fig. 38. A, femur; B, tibia; C, transverse ligament; D, anterior crucial ligament; E, posterior crucial ligament; F, F′, cut halves of patella.

The technique recommended for the operation is as follows: The knee is flexed over the table at almost a right angle; a vertical incision starts an inch above the patella, extending almost to the tubercle of the tibia. The patella is sawn vertically and its ligament split. The segments of the patella are separated to the border of the condyles. The fat behind the patella is removed, when an excellent view of the spine and anterior crucial is obtained. Any obstructive mass is removed, the knee is straightened, and the ligament of the patella, the aponeurosis, and the extensor are stitched (*Fig.* 38).

Reference.—[1]*Brit. Jour. Surg,* 1913, July, 70.

LABOUR.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

Sequelæ.—Solomons,[1] as a result of examining 543 primiparæ sixteen days after labour, found that 40 per cent only were quite normal. Cervical laceration after normal labour is very common, 264 (or 48 per cent) having a tear of over one-third of an inch. He suggests immediate suture if there is bleeding from the tear; if there is no hæmorrhage, suture after two months; or a routine examination at the end of child-bearing in all women when all lacerated cervices should be repaired. Post-partum retroversion, when not caused by inflammation, is due to the dorsal decubitus, and the best treatment is therefore postural. Every patient should be examined a month after labour for this complication. Solomons found it in 6 per cent of his cases. Non-union of a stitched perineum was found in 3 per cent; he advises an immediate second perineorrhaphy in all aseptic cases. No definite rule can be made about early rising in the puerperium as a prophylactic against pulmonary embolism until more statistics have been published. He advises free movement and gymnastic exercises from the beginning, the patient to get up from the twelfth to the fourteenth day.

Obstructed Labour.—Stellwagen[2] considers the operation of **Cæsarean Section** in experienced hands simple and harmless when performed at the time of election and not as an emergency. He thinks that the field for this operation is enlarging, and it is therefore important that its high mortality rate in cases of emergency should be averted by the obstetrician making an early decision as to treatment. The risk of the operation increases proportionately to the severity of the previous manipulations.

Jeannin[3] describes the technique of abdominal Cæsarean section as usually performed in France. The incision in the abdominal wall is ten to twelve inches long. The uterus is eventrated, and then opened by a longitudinal incision of six to eight inches on the anterior wall of the uterus which does not touch the lower segment. The uterine wall is stitched up in one layer with silk sutures which do not include the mucous membrane. The abdominal wall is closed in layers and no drainage is used.

Maxwell[4] describes four cases of Cæsarean section which had to be undertaken for what are always regarded as rare indications: one for malposition of the uterus due to previous ventrofixation and causing dystocia, one for central placenta prævia at the thirtieth week of pregnancy, and two for obstruction due to uterine fibroids. In both of these latter cases subtotal hysterectomy was performed. All the mothers and two children did well; one child at the thirtieth week dying in a few days, and another dying when ten days old as the result of a burn. He prefers abdominal to vaginal Cæsarean section; he does not eventrate the uterus before delivering the child, and considers that the earlier in labour the operation is done the smaller is the mortality, owing to diminished risk of sepsis.

Schwarz[5] reports a case of rupture of a pregnant uterus on which classical Cæsarean section had been performed three and a half years before for severe eclampsia at the eighth month of pregnancy. The uterus was opened by the transverse fundal incision, which was sutured with interrupted catgut sutures. Both mother and child did well. At the second operation the abdomen was opened, and the child and placenta were found in the abdominal cavity. The uterus was firmly contracted, the rupture extending through the old incision from one tubal pole to the other. Subtotal hysterectomy was performed, and the patient did well.

Savage[6] describes three cases of **Pubiotomy**, and discusses its limitations. He considers that it should only be performed when the child is alive and likely to live; in cases where the pelvic contraction is only moderate, the true conjugate measuring from 3 to 3½ inches; after trial of forceps with the patient in Walcher's position, and when the patient is free from infection. Wallace[7] describes two cases, and discusses the merits of the operation. He considers that it should only be done where the addition of an extra ½ inch to the conjugate will render delivery easy, where there is no suspicion of infection, and the child is presenting by the head. It should not be regarded as a rival to induction of labour, Cæsarean section, and craniotomy, but should be confined to the limits mentioned above.

Clifford White[8] describes three cases of *dystocia due to a contraction ring*, discusses the condition, and reviews the literature. He insists upon the recognition of a contraction ring as a condition distinct from, and very different from, a retraction ring or ring of Bandl. Its causes are premature rupture of membranes, intra-uterine manipulation, increased irritability of the uterus, malpresentations, uterine inertia, and parity. The prognosis is bad; in his series of cases not treated by laparotomy, the maternal mortality was 38 per cent and the fœtal 63 per cent, while in cases treated by laparotomy the maternal mortality is 31·5 per cent and the fœtal 42 per cent. The three varieties of treatment which are most useful are **Continuous Weight Traction, Embryotomy,** and **Cæsarean Section.** Of these he considers that Cæsarean section gives the best results.

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LABYRINTHITIS. (*See also* VERTIGO.) *Geo. L. Richards, M.D.*

Henninger,[1] from a review of the literature of *acute labyrinthitis*, finds it to be either serous or purulent, and due to an invasion of the labyrinth by toxins or pathogenic germs. It may be diffuse or circumscribed, and arises as a complication in acute or chronic suppuration of the middle ear and mastoid, and also during the course of severe infections, as diphtheria and scarlatina. In serous labyrinthitis the onset may be either sudden or gradual, the temperature normal or slightly elevated; the pulse is usually rapid. Tinnitus, dizziness, nausea, and disturbance of equilibrium are often complained of. The hearing is reduced, but the vestibular apparatus responds to stimulation. Spontaneous nystagmus is present, and is directed toward the diseased side. These conditions indicate the early stages with gradual onset. Cases of sudden onset present conditions difficult to differentiate from the purulent type. Purulent labyrinthitis produces nausea and vomiting, fever, headache, tinnitus (early), deafness later, nystagmus, loss of labyrinthine irritability and vertigo. The onset is sudden with a distinct rise in temperature, often accompanied by facial paralysis. At first the nystagmus is to the diseased side, but later in the progress of the disease the end organs of the vestibular nerve lose their function and the nystagmus is to the sound side. This is often known as increased irritability of the sound labyrinth. The vertigo and disturbance of equilibrium continue for several days, and the patient, unable to assume the erect position, lies on the side towards which the nystagmus is directed. All efforts to stimulate the vestibular apparatus are futile, and by applying the Neumann "noise apparatus" to the sound ear, the diseased ear is found incapable of detecting the most penetrating sound. Complications arising from purulent labyrinthitis may be meningitis, cerebral or cerebellar abscess; the latter is the most frequent. Acute purulent labyrinthitis must be differentiated from cerebellar abscess, as nystagmus plays an important factor in both conditions. Nystagmus towards the affected side may be due to an early circumscribed labyrinthitis or a cerebellar abscess. A cerebellar abscess cannot be excluded prior to an operation on the labyrinth. After a conjoint radical mastoid and labyrinth operation, if the rotatory nystagmus is directed towards the diseased side, a diagnosis of cerebellar abscess can be made. Serous labyrinthitis calls for a mastoid operation, simple or radical, after which the patient is carefully observed. Cases with labyrinthine complications following acute mastoiditis or an acute exacerbation of a chronic process, are put to bed for absolute rest, after removal of the primary foci. Circumscribed labyrinthitis is treated expectantly.

Dench[2] believes that in the future labyrinth exploration will be performed in certain cases of impairment of hearing progressive in type and involving the labyrinth. He describes an ideal operation as performed upon the cadaver for non-suppurative labyrinthine lesions. This operation can be performed through the ordinary mastoid operative field without a preliminary radical operation, provided the zygomatic cells have been included. In order to obtain a perfect view of the promontory, and enable the operator to remove the bony wall of the first, and a portion of the second turns of the cochlea by taking down the ridge of bone separating the oval and round windows, it is necessary to perform a complete radical operation; but such interference with the cochlea is not necessary in cases suffering from vertigo.

Shambaugh[3] operates upon the labyrinth in cases of labyrinth suppuration when clinical symptoms exist which suggest an early intracranial complication, such as altered cerebrospinal fluid, severe unilateral headache, etc.; where the labyrinth empyema develops as a part of a violent acute panotitis; where the indications for a mastoid operation exist; where it develops as a sequel to chronic purulent otitis media, with clear indications for a radical mastoid operation; where the labyrinth suppuration is complicated by erosion of the labyrinth capsule, by fistula formation into the labyrinth, by facial paralysis or by sequestration of a part or the whole of the labyrinth capsule.

Lewy[4] finds *degeneration of the nerve of hearing* more apt to occur in men, in those who work in a continuous noise, and past middle age. In young people it may follow the infectious diseases, meningitis, mumps, or hereditary syphilis, without being preceded by suppurative lesions. The patient comes to the otologist too late. Loss of hearing is usually severe, and is unequal in both ears, with a marked loss of the upper tone limit. Quinine, alcohol, and tobacco play an important part in its etiology.

REFERENCES.—[1]*Laryngoscope*, 1913, July; [2]*Ibid.* Aug; [3]*Ann Otol.* 1913, June; [4]*Laryngoscope*, 1913, Mar.

LACRYMAL APPARATUS. DISEASES OF THE.

A. Hugh Thompson, M.D.

As an alternative to excision of the sac in obstinate cases of *obstruction of the nasal duct*, operations have been devised to establish a new channel by means of which the lacrymal sac may be drained directly into the nose. The best known of these operations is that of Toti, thus described by Harrison Butler[1]: "Toti exposes the sac, turns it back, and cuts a window in its inner wall. He now chisels out a piece of the adjacent bony wall of the nose and exposes the nasal mucosa. The nose is packed with gauze after removal of the inferior turbinate bone, if necessary, and, in some cases, of some of the ethmoidal cells. A window is cut in the nasal mucosa the same size as that in the lacrymal sac, and the edges of the two fenestræ are united by sutures. Toti claims that after this operation the natural drainage of the conjunctival sac is restored. Not only can fluid be freely syringed into the nose, but fluorescein instilled into the conjunctival sac appears in the nose."

West's[2] operation is very similar, but he lays stress on the preservation of the inferior turbinated bone. One would think this would make the operation an extremely difficult one; but West, who has had at his disposal a large number of lacrymal cases from the clinic of Professor Silex, in Berlin, claims to have had very good results in 90 per cent. of them. Neither this nor Toti's operation, however, is likely to find much favour with the majority of ophthalmic surgeons, for three reasons: the technique is difficult except to the practised rhinologist; there is a risk of septic infection starting from the nose and travelling by the new route to the eye; and extirpation of the lacrymal sac, if efficiently performed, is quite a satisfactory operation in the great majority of cases. A consideration to the contrary, however, is pointed out by Wray—namely the possibility that it may predispose to senile ectropion, a condition which partly depends on preservation of the tear passages in their natural state. Whether this is so or not will hardly be known until there are a sufficient number of old people who have had their sacs removed in earlier life. Wray himself, recognizing the objections to the nasal methods of operating, adopts a modified form of the old treatment by styles inserted into the nasal duct.[3]

In some cases it is impossible to cure *dacryocystitis* without dealing with the accompanying caries or inflammation of the ethmoid bone, and Kleer[4] insists on the importance of co-operation between nasal and ophthalmic specialists in these cases. The only satisfactory method of diagnosing ethmoidal disease, he says, is by means of *x* rays. In cases where the diseased ethmoid can be dealt with by operative measures, the prognosis of the lacrymal disease becomes extremely good.

REFERENCES.—[1]*Brit. Med. Jour.* 1913, ii, 1144; [2]*Berl. klin. Woch.* 1913, 92; [3]*Med. Press and Circ.* 1913, ii, 315; [4]*Deut. med. Woch.* 1912, 1040.

LARYNX.

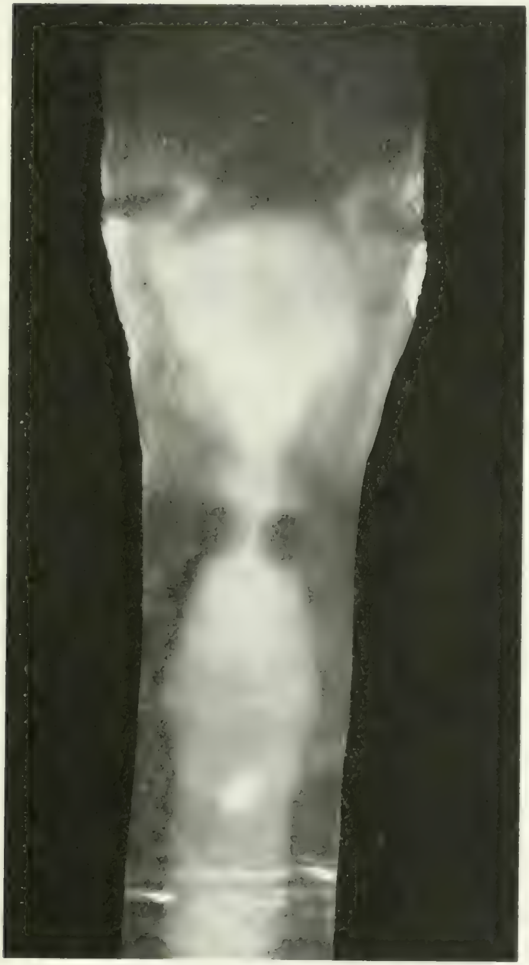
W. G. Porter, M.B., F.R.C.S.

Radiography.—Rethi,[1] dissatisfied with lateral pictures of the larynx, and finding it impossible to take an antero-posterior picture by the ordinary method, owing to the thickness of the spinal column, had the idea to overcome this difficulty by placing a film directly behind the larynx in the hypopharynx, and making the exposure from before backwards. He was at once successful. It is very important that the films should be cut to the right size and properly packed. It must be larger above to fit the hypopharynx, and narrower below to pass into the œsophagus, and the corners must be carefully rounded. It is laid on a piece of cardboard which is cut to the same size and wrapped in tinfoil. The cardboard and film are then wrapped, first in black light-proof paper and then in wax paper, so that it is both light- and water-tight. The pharynx and hypopharynx must be carefully anæsthetized. The photograph is taken with the patient lying down and with the head slightly bent backwards, but as the film is introduced it must be slightly bent forwards. The film in its wrappings is made slippery with liquid paraffin, introduced with the second and third fingers of the left hand, and pushed home with the same fingers of the right hand. The patient must now breathe quietly, and the exposure is made. The film is then removed with a pair of forceps. The length of exposure naturally depends on the apparatus; short exposures are less disagreeable to the patient. In the skiagram the body of the hyoid bone is clearly seen above (*Plate XXV*). Occasionally the epiglottis can be seen below as a triangular shadow whose rounded upper border extends above the hyoid bone. The body of the thyroid cartilage appears as a shadow. The false cords, the true cords, and the sinus are clearly distinguishable. Anatomical alterations, e.g., recurrent paralysis, are readily recognized, while stenoses and the extent of malignant disease can also be determined.

Suspension Laryngoscopy.—Killian,[2] to whom laryngology owes so much, has greatly added to his services by devising an entirely new method of directly inspecting the larynx, which he has termed suspension laryngoscopy. By it an extremely good and complete view is obtained of the pharynx, the larynx, and the hypopharynx (*Plate XXVI*). It consists in suspending the head, which is allowed to hang over the table, by the lower jaw, by means of a tongue spatula, which is hooked on to

PLATE XXI.

RADIOGRAPHY OF THE LARYNX

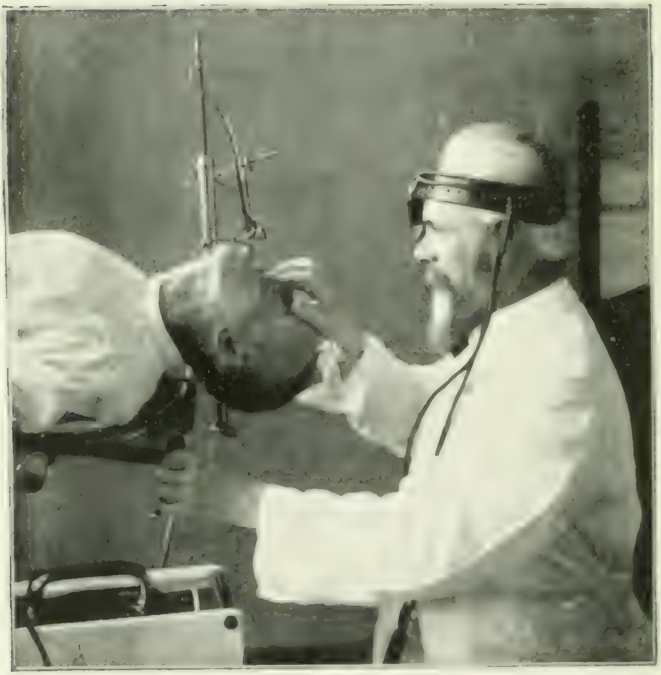


[illegible] Larynx by Radiography.

[illegible]

PLATE XXVI.

KILLIAN'S SUSPENSION LARYNGOSCOPY



[illegible]

a gallows consisting of an iron bar bent nearly at a right angle, which can be moved easily by cranks upwards, downwards, forwards, and backwards. The horizontal part of the bar is hollowed out in several places in order to receive the hook spatula. This consists of three parts: the handle, the tongue spatula, and the mouth gag. The examination may be carried out under local anaesthesia in a tolerant patient, but if chloroform is given it should be preceded by an injection of morphine and scopolamine. The gallows is fixed to the right of the table, and the surgeon is seated opposite the end of the table. The patient is placed with his head projecting over the end of the table and hanging slightly back. To suspend the patient, the spatula is hooked on to the gallows, which is then adjusted until its mouthpiece can enter the mouth. Until the final adjustment of the spatula is made, the head is supported; after that it is allowed to hang free. Once the instrument is in place, the surgeon has both hands free for any operative interference, and there is no doubt that the larynx and hypopharynx are made much more accessible by this than by any other method of examination. From Killian's own experience, and that of others who have practised the method, it may safely be predicted that it has a future. Freudenthal[3] has found it of great practical value, especially in the operative treatment of tuberculosis and tumours of the larynx. Davies[4] has also found it of use in a number of cases, including one in which he removed a pin from the lower pharynx in an infant aged 11 months.

The Epiglottic Suture.—Horsford[5] has modified his instrument for passing a suture through the epiglottis to facilitate intralaryngeal inspection and indirect operative procedure (*Fig.* 39). This instrument is a modification of Kurz's forceps used for the passage of deep sutures in pelvic surgery. Before its employment, cocaine is applied to both surfaces of the epiglottis, and the needle is threaded with silk and placed in the proximal blade. With the aid of a laryngeal mirror, the forceps are introduced into the throat until the upper border of the epiglottis is seen to pass between the point of the needle and the distal blade; the blades are firmly closed and then opened, and the instrument withdrawn; it will then be found that the suture has passed through the epiglottis. The ends are gripped by a pair of forceps and allowed to hang below the jaw. A third hand is not required to hold them.

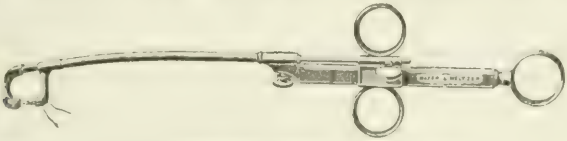


Fig. 39.—Horsford's epiglottic suture forceps.

Cancer.—McKenzie,[6] in a case of **Laryngectomy** for laryngeal cancer in which a tracheotomy had previously been carried out, modified the usual technique of dividing the trachea and bringing the cut end through a slit in the skin just above the episternal notch. Instead of this, he closed the upper opening in the stump of the trachea and retained the tracheotomy tube. The closure of the trachea prevented discharge finding its way into the lungs. The result was eminently satisfactory.

Crile[7] has performed 27 laryngectomies for cancer, with 2 operative fatalities, or a mortality of 7 per cent. The special dangers of the operation are pneumonia, local infection, mediastinal abscess, vagitis, and reflex inhibition of the heart and respiration through mechanical stimulation of the superior laryngeal nerves. To avoid mediastinitis, a preliminary low tracheotomy is performed, and at the same time the deep planes of the base of the neck are opened and packed with iodoform gauze, a strong protective barrier of granulations being thus formed. The general anæsthetic of choice is nitrous oxide, but ether may be given. A piece of rubber tubing slightly larger than the trachea is substituted for the tracheotomy tube through which the anæsthetic is administered; the site of the skin incision is infiltrated with novocain, and the larynx completely freed. The trachea or cricoid is divided at a level free from the disease, novocain being again infiltrated at this part. The larynx is raised and separated from the œsophagus. The upper end of the larynx is then cut free. The opening in the pharynx is sutured and the rest of the wound left open. With this wide opening secretions may be prevented from entering the trachea, which is left lying in its natural bed.

Della Vedova and Castellani[8] treated two cases of carcinoma of the larynx by **Early Thyrotomy**. In the first, the operation had been performed four years before publication. The patient at that time was 48 years old. The tumour was situated at the middle of the left vocal cord. The voice was fairly good, although the whole of the left vocal cord was removed. The second case was reported eleven months after the operation. The patient at that time was aged 60; the whole of the right cord was involved in a red swelling, which had an irregular surface. In this case also the functional result was satisfactory. In neither case was there a trace of recurrence. The authors mention in their paper that they had operated on 12 cases by thyrotomy for cancer of the larynx between the years 1907-1911, with 7 cures; there were 2 deaths through post-operative inflammation of the lungs, while 3 of the cases which were dismissed as cured had not returned to report. In 5 additional cases they had operated by the intralaryngeal method: in none had there been a recurrence; one of these was operated upon in 1907.

Tuberculosis.—Sir St Clair Thomson[9] states that tuberculosis affects the larynx more frequently than any other disease. In the later stages of pulmonary tuberculosis, the disease is discovered in the larynx in 12 per cent of cases. The principles of **Sanatorium Treatment** must be insisted upon, tobacco and alcohol should be abandoned, and, in early cases, strict silence should be enforced. When there is marked dyspnœa a **Median Tracheotomy** is carried out under local anæsthesia

In the author's experience, treatment with tuberculin had no effect in the majority of cases. Relief to dysphagia may be obtained by a laryngeal insufflation of 3 to 5 gr. of **Anæsthesin**, or by the injection of **Alcohol** into the superior laryngeal nerve.

Chalier and Sonnet[10] advocate **Division of the Superior Laryngeal Nerve** in cases where these measures have failed to give relief. It is a simple operation, and can be carried out under a local anæsthetic. A horizontal incision is made, 4 cm. in length, between the hyoid and thyroid cartilages, extending forwards from the anterior border of the sternomastoid. The nerve is looked for on the thyro-hyoid membrane, and is divided there, care being taken to avoid injury to the external branch.

Stenosis following Diphtheria.—Richardson[11] believes that the following are causes of stenosis following diphtheria: (1) Prolonged intubation, laryngotomy, or high tracheotomy; (2) The severity of the attack and the presence of a secondary infection; (3) Injury to the larynx during intubation or extubation. To prevent the development of stenosis he advises that intubation should not be prolonged much beyond a month. Tracheotomy should then be resorted to, if necessary, and should be done as low as possible. If stenosis develops, intermittent dilatation should be carried out under direct vision until the larynx reaches about normal size.

Paralysis.—Dundas Grant[12] reports two very unusual cases of recurrent paralysis of the left vocal cord apparently due to *alcohol* as a toxic agent, in which recovery ensued after abstention from alcohol. He points out that toxic paralyses are usually bilateral. Dorendorf[13] discusses the effect of *auricular enlargement* as a cause of recurrent paralysis of the left vocal cord. He believes that the anatomical possibility of this condition has not been sufficiently proved. In four patients with left recurrent paralysis which he observed in cases of mitral stenosis, he convinced himself that the paralysis was not due to the enlargement of the auricle, but to an extension of inflammation from the pericardium (which was present in his cases) to the posterior mediastinum, in which the vagus and recurrent laryngeal nerves lie. He thinks that in several of the previously published cases mediastinitis was probably the real cause of the paralysis.

REFERENCES.—[1]*Zeits. f. Laryng.* 1913, 27; [2]*Arch. f. Laryng.* 1912, 277; [3]*Med. Rec.* 1913, i, 528; [4]*Brit. Med. Jour.* 1913, i, 115; [5]*Ibid.* 928; [6]*Lancet,* 1913, ii, 287; [7]*Ann. Surg.* 1913, ii, 164; [8]*Zeits. f. Laryng.* vi, 65; [9]*Pract.* 1913, i, 243; [10]*Presse Méd.* 1912, 931; [11]*Bost. Med. and Surg. Jour.* 1913, i, 749; [12]*Lancet,* 1913, ii, 104; [13]*Berl. klin. Woch.* 1913, i, 912.

LEISHMANIASIS. (*See also* ANÆMIA IN CHILDREN.)

Leonard Rogers, M.D., F.R.C.P.

A discussion on this subject at the British Medical Association[1] was opened by Patton, who summarized the investigations he had carried out during the previous seven years on the rôle of insects in carrying the infection. He agrees with Rogers in considering the flagellate stage as an insect herpetomonas, and the only insect in which he has found it to develop is the bed bug. Recently, he has found that when the flagellate stage has developed in a bed bug, it is killed by a second feed of blood. He has failed to infect dogs or monkeys, and until a susceptible animal is found, the final step in the transmission of the disease cannot be accomplished. At the same meeting, Fantham described some flagellates naturally met with in insects' alimentary canals, which must be borne in mind in studying the transmission of protozoal diseases by their means.

Row[2] has succeeded in producing local lesions in monkeys by the injection of both fresh human parasites and cultures of the same. The incubation periods were nine weeks and three months respectively. Even after ten months the condition remained localized, and the general health of the monkey was not affected. One nodule atrophied and became absorbed. One nodule was excised two weeks after its appearance, and showed the parasites in the tissues. From this, two mice were injected intraperitoneally and developed general infection. A monkey infected intraperitoneally at the same time remained apparently well, but four and a half months later its liver on aspiration showed typical kala-azar parasites, proving a general infection. A second passage into mice failed.

Castellani[3] records a case of intractable ulcers of the pharynx in which he found Leishman-Donovan bodies. Previous anti-syphilitic treatment had failed. There were no cutaneous lesions, but he had suffered from fever occasionally. The throat condition had persisted for nine years.

H. Seidelin[4] describes a form of *Leishmania tropica* he met with in Yucatan in Mexico, which is characterized by the ear being the seat of the infection. He found the parasites in four out of six cases, the two negative ones having been examined only once. Darling and Connor had described a similar case at Panama.

Umberto Gabbi[5] maintains the identity of infantile kala-azar of North Africa and the adult form of the disease; in confirmation he points to Marshall's successful infection of dogs with parasites of the adult disease, and also quotes Nicolle's opinion in favour of his view.

R. A. P. Hill[6] has studied kala azar in North China, and has noted that the red corpuscles in this disease alone do not dissolve, but run into lumps, not easily broken up by shaking, in the special leucocyte diluent he uses. This is composed of: (a) Wright's modification of Leishman's stain, saturated and filtered, 2 parts; pure methyl alcohol, 1 part; (b) 0·1 per cent solution of pure sodium chloride in distilled water. Add 1 part of (a) to 2 parts of (b), shake well, and use within half an hour. He suggests that the peculiar behaviour of red corpuscles in this solution may be diagnostic of kala-azar, as he found it in eight consecutive cases, but never in other forms of enlarged spleen, such as malarial.

TREATMENT.—O. v. Petersen[7] reports on the treatment of Oriental sore with **Salvarsan**, based on 120 cases, and concludes that it is a specific in doses of 0·4 to 0·6 gram intravenously, several injections being often required.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, ii, 1104; [2]*Ibid.* 1106; *Jour. Trop. Med. and Hyg.* 1912, 327; *Ibid.* 1913, 1; [3]*Ibid.* 49; [4]*Ann. Trop. Med. and Hyg.* 1912, 205; [5]*Jour. Trop. Med.* 1913, 108; [6]*Lancet*, 1913, ii, 892; [7]*Munch. med. Woch.* 1912, 2401.

LEPROSY.

Leonard Rogers, M.D., F.R.C.P.

BACTERIOLOGY.—The controversy between those who have cultivated different organisms from leprosy cases still continues. At the British Medical Association meeting of 1912, Duval and Bayon[1] read papers on their respective organisms, based on investigations recorded in the last MEDICAL ANNUAL, and in the discussion G. Dean stated that much more work was required on the subject before any safe conclusions could be arrived at. At the same meeting M. E. Marchoux dealt with rat leprosy, the infection of which is conveyed from one animal to another by bites. Bayon, in a further paper,[2] gives a good summary of his position, and records local and febrile reactions in lepers by intradermal injections of an extract of his organism made on similar lines to Koch's tuberculin, while healthy controls did not react. If these results are confirmed by further experience, they will be of great value in effecting an early diagnosis of the disease, while they will go far towards establishing his organism as the cause of leprosy. He has been able to produce leprosy-like lesions in rats with the bacillus first cultivated by Kedrowsky and later by himself, but obtained negative results with Rost's and Duval's bacilli.

S. P. Impey[3] records an interesting account of his experience of the symptoms and diagnosis of leprosy at Robben Island. He thinks the dangers of contagion are very slight in the nodular form, and absent in the anæsthetic variety. Mixed forms are uncommon, and in them both varieties of lesion exist from the first. The tuberculous form should only be diagnosed by finding bacilli in the serum of the lesions, or in the nasal discharge, where they are often present early in the febrile stage. In warm countries the nodules are commonly limited to exposed parts, especially the face, wrists, and ankles, and are rare on the trunk. In the anæsthetic form he thinks the bacilli are only found during the first four years, the later lesions being due to the damage already done to the nerve trunks. As the bacilli cannot be found, the diagnosis is often difficult at first, but the limitation of the affection to the nerve trunks not extending much above the elbows and knees is significant. The anæsthetic patches do not contain the bacilli. Ulceration is caused by injuries to the anæsthetic parts, such as by burns, etc., which cause no pain.

H. Bayon[4] publishes a further full review of the literature of leprosy, including his own valuable work, illustrated by excellent coloured plates. The bacteriology and animal experiments are dealt with and the evidence in favour of the contagiousness of the disease set out.

TREATMENT.—Creighton Wellman[5] records a trial of **Salvarsan** injections in the treatment of leprosy. The presence and condition of the leprosy bacillus were ascertained before and after the doses. Out of 6 cases, 1 died from accidental burns before the observations were completed. Clinical improvement occurred in 4 of the 5 remaining, but in only 2 of them did the organisms disappear from the tissues, although in 4 partial or complete resolution of the nodules examined microscopically was found. He is doubtful if salvarsan gives better results than other preparations of arsenic, which have long been used with benefit in the treatment of leprosy.

T. C. Rutherford[6] has treated 20 cases of leprosy in India with weekly injections of **"Leprolin"** for from 100 to 153 days. Full tabulated notes were taken before and after the treatment, and the changes in each symptom noted. An analysis of these data showed that in only 5 cases did the number of symptoms which improved exceed those in which deterioration took place, while retrogression was in excess of improvement in 14, probably as a result of the natural progress of the disease, although in one it was so marked that it seemed most likely to have been caused by the treatment.

T. S. Davies[7] reports one case in which injections of an extract made from a culture of Bayon's produced remarkable improvement.

T. L. Sandes[8] deals with the **Surgery** of leprosy, by means of which so much relief can be afforded. Anæsthetics are often unnecessary, and owing to heart atrophy, ether or lumbar anæsthesia is preferable to chloroform. Ulcers require rest and antiseptic treatment; if extensive, scraping and skin-grafting may be useful. In the case of necrosis of small bones, such as phalanges, it is best to remove them completely. Nerve anastomosis may sometimes be indicated for paralysis. Amputation by circular incision is occasionally necessary for extensive ulceration. E. S. Goodhue[9] also writes on the surgical cure of leprosy, and thinks that if the primary lesion can be detected early it might be excised with success.

A. Heymans[10] and D. J. Wood write on the eye complications of leprosy, the former especially dealing with "lagophthalmus," and a method of operating to remedy the affection and save the exposed eye from injury.

Administrative Measures.—Bayon[11] has also dealt at length with this aspect of the question in a report to the Cape Government on the Robben Island Asylum, and advises universal segregation under more comfortable conditions in order to stamp out the disease for good.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, ii, 1180; [2]*S. Afr. Med. Jour.* [illegible]; [3]*S. Afr. Med. Rec.* 1913, 279; [4]*Ibid.* 201; [5]*N.Y. Med. Jour.* 1912, ii, 996; [6]*Ind. Med. Gaz.* 1913, 91; [7]*S. Afr. Med. Rec.* 247; [8]*Ibid.* 250; [9]*N.Y. Med. Jour.* 1912, ii, 200; [10]*S. Afr. Med. Rec.* 1912, 240; [11]*Ibid.* 187.

LEUKÆMIA. (*See also* LEUKÆMIC ERUPTIONS OF THE SKIN.)

Herbert French, M.D., F.R.C.P.

ETIOLOGY.—Various attempts have been made from time to time to produce leukæmia experimentally in animals by the use of blood or organ-extracts derived from human cases of the disease. Hitherto these attempts have proved abortive, but if some recent work done by

Wiczkowski[1] is confirmed, considerable light will be thrown upon the pathology of this remarkable disease. He injected intravenously into fowls (1) blood, (2) emulsion of freshly excised lymphatic glands, and (3) pleuritic exudate, all derived from the same patient suffering from leukæmia. Those fowls that received blood or gland-emulsion remained perfectly well; but those into which leukæmic pleural exudate was inoculated fell seriously ill, with symptoms closely analogous to those of the original leukæmia. The mucous membranes became blanched, the feet œdematous, the general condition went from bad to worse. The blood-picture, originally normal, passed on to one of great lymphocytosis. After death, the spleen was found to be enlarged, the bone-marrow red, the liver swollen, with diffuse white punctate deposits of lymphocytic infiltration. Blood taken from fowls that gave this reaction to human pleural exudate injected into ten other healthy fowls, produced a similar positive result; and Wiczkowski is now engaged in further experimental work, using the blood of these fowls in an attempt to produce leukæmia in quadrupeds.

Diagnosis.—Another step towards linking together the lymphatic and the splenomedullary leukæmias, the interrelationship between which seems so probable, is taken by Reschad.[2] He claims to have discovered an entirely new kind of leukæmia which he styles "*splenocytic*;" his "splenocytes" do not appear to be an entirely new sort of cell, however, but rather transitional between large lymphocytes on the one hand and myelocytes upon the other. That the blood of a case of splenomedullary leukæmia may sometimes change to a lymphæmic type in the last stages, has been known for some time; Reschad now shows us that a case may have an intermediate blood-picture throughout its course, not in the sense that both lymphocytes and myelocytes are abundant at the same time, but in the sense that the predominant cells present are neither large lymphocytes nor myelocytes, but something midway between the two. He calls these intermediate white corpuscles "Uebergangsformen," or "splenocytes."

Dunn,[3] on the other hand, holds that it is impossible to tell from ordinarily stained films, whether the leucocytes in leukæmic blood are really large lymphocytes, and he states that many cells so termed by observers in the past are really immature myelocytes—myeloblasts; and that, in order to distinguish myeloblasts from lymphocytes, it is necessary to stain the blood-films by the *indo-phenol-oxydase* process. This consists in fixing the films by immersion in 1 per cent osmic acid for five seconds, washing thoroughly in running water for five minutes, and then immersing in a mixture of equal parts of:—

Di-methyl-paraphenylene-diamine, ½ per cent aqueous solution
Alpha-naphthol - - - - saturated aqueous solution

for periods varying up to half an hour. The films are then washed for a few minutes in running water and mounted on slides in a mixture of equal parts of commercial water-glass and tap-water. Normal blood-films treated in this way show a deep-blue staining of the polymorphonuclear leucocytes, owing to the formation of indophenol in their protoplasm in consequence of the oxydizing ferment or *oxydase* present in them. Lymphocytes contain little or no oxydase; myelocytes and most myeloblasts contain it, and therefore stain blue by the above process; and Dunn's researches show that many cases of supposed lymphatic leukæmia are really examples of acute myeloid leukæmia, the prevailing cells being myeloblasts or precursors of myelocytes, and not large lymphocytes as hitherto supposed.

The diagnosis of leukæmia is generally based upon the existence of a considerable or extreme degree of leucocyte increase in the blood; but various circumstances may cause the blood to show no such increase although the disease is undoubtedly leukæmia; this is often the case, for instance, after treatment by repeated local application of x rays to the splenic region; or again, after the administration of benzol either by the mouth or by injection. It is not surprising, therefore, that the disease sometimes presents itself clinically without leucocytosis—even when there has been no treatment—*aleukæmic leukæmia*. Three cases of this kind are reported by Waterhouse[1]; two were adults, one a child. The symptoms common to the three cases were profound anæmia, hæmorrhages (especially epistaxis), irregular pyrexia, enlarged glands, the cervical being specially affected, and slight enlargement of the spleen. The blood in all cases was pale and watery, but clotted rapidly. The red blood-cells numbered about a million and a half, the hæmoglobin being diminished but little more in proportion, so that the colour index was only just below normal. As regards the leucocytes, the count varied between 3,000 and 11,300, except that just before death the blood became crowded with lymphocytes. Basophils (with one or two doubtful exceptions) and eosinophils were absent in all films examined. The polymorphonuclear cells were diminished in number in every instance, and generally very markedly. The lymphocytes were generally about normal in number, but were sometimes greatly increased. There was always a relative increase. Post-mortem examinations in all these cases disclosed lesions typical of lymphatic leukæmia.

A fresh case of *myeloid* leukæmia, also without leucocytosis, is recorded by Reid, Calwell, and Thomson.[2] The diagnosis was afforded partly by the clinical symptoms, but mainly by the positive oxydase reaction of the leucocytes (*vide supra*).

Chloroma.—Herring[3] reports two new cases, and summarizes the literature. Each patient presents almost the same symptoms, and it is not difficult to diagnose the disease. It is, however, not a distinct pathological entity, but rather a peculiar variety of leukæmia. The painful exophthalmos, with gradual developing visual disturbance, earache, and deafness, frequently first directs the patient to the specialist, and that probably accounts for the fact that the earlier cases reported were first seen by the oculist or the aurist. In rare instances, the internist is consulted by reason of the progressive anæmia, general weakness, and purpuric or hæmorrhagic manifestations. When once the disease is manifest, it takes a rapid course, being more marked in younger patients. The average duration is from three to four months, only quite exceptional cases surviving for over a year.

Two distinct forms are recognized, the lymphatic and the myeloid, the former being much the more frequent. There may be no absolute leucocytosis, but more often there is some; and the white cells may number from 300,000 to 1,880,000 per c.mm. In both forms the hæmoglobin content is usually greatly diminished, the red cells becoming also variably reduced in number from 3,000,000 down to 1,000,000, and even less, per c.mm. The colour-index is usually minus. The morphology of the red cells is such as characterizes the different severe anæmias, and changes in form and size, poikilocytosis, polychromasia, and occasional basophilic degeneration, have been observed. Nucleated red cells are frequently noted. The erythroblasts are seen to be most numerous in the younger patients. The anæmia usually becomes more pronounced in the later stages of the illness, and is often augmented by external influences, such as excessive hæmorrhage through epistaxis, hæmatemesis, hæmaturia, etc.

The spread of tumours in the cranial and facial bones explains most of the characteristic symptoms. Tumours in the orbit produce a marked prominence and crowding of the bulb, giving rise to the symptoms of exophthalmos, and, as the lids are unable to cover the bulb, the sight soon becomes disturbed and finally is destroyed. As the tumour spreads on the facial bones and the temporal region, the deformity produced in the skull leads to a peculiar "frog-like" aspect, which permits of an easy diagnosis at the first glance. By the predilection of the tumours for the periosteum and dura mater of the cranial bones, the involvement by pressure of the cranial nerves is easily explained. It is peculiar that only three nerves are usually involved: the optic, by reason of orbital pressure; the facial; and the auditory, on account of the involvement of the temporal bone.

TREATMENT.—Koranyi[7] records 8 cases of leukæmia treated with benzol. In 1, neither *x*-rays, thorium-*x*, nor benzol did any good; in 1 the benzol could not be taken; in the remaining 6 it was most beneficial; the leucocyte counts fell from hundreds of thousands to about 12,000; the spleen shrank; enlarged glands disappeared; the erythrocytes rose steadily to nearly normal; and the patients averaged an increase of weight by 10 kilos each. He agrees that it is too early to say what the permanent effects are, but he is convinced of the benefits obtained temporarily.

Klein[8] holds that up to the present he has seen the best results obtained in the treatment of leukæmia from the use of the **X-rays,** though even with these the effects are but partial and temporary; some cases, however, do not seem to benefit at all, and in 22 he tried the **Benzol** treatment, either as well as, or instead of, the *x*-rays. Three of these were cases of acute, 1 subacute, 14 chronic myeloid leukæmia, 4 lymphatic leukæmia. Ten had been under observation too short a time to warrant conclusions, but he reports the results in the remaining 12 in detail—8 chronic and 1 subacute myeloid, and 3 lymphatic. He gave from 2 to 5 grams of benzol daily, mixed with equal parts of olive oil, in gelatin capsules, usually by the mouth, but occasionally by intravenous injection. His general conclusion is that benzol given by the mouth is of great value in the treatment of certain cases of leukæmia; that it is uncertain in its action, however; that it may cause so much gastro-intestinal irritation that it has to be discontinued, although in others it does not upset the stomach at all; that it seems to exert a specific stimulating action on the blood-forming centres; that, contrary to expectation, it seldom leads to renal irritation; and that it acts particularly well in cases that are having x-ray treatment of the spleen at the same time.

Stern[9] reports one case of leukæmia treated by him with benzol, and speaks highly of its value. The leucocytes fell in three months from 204,000 to 14,200 per c.mm., the myelocytes disappearing almost completely. The spleen returned to normal size, the patient felt strong and well, and had gained 2 kilos in weight.

Wachtel,[10] from personal experience, says that although benzol may be very beneficial in some cases of leukæmia, and is much more applicable in private practice than thorium or x rays, it has to be used with great caution, and the patient closely watched. Of two recent cases of his, one took the benzol quite well for six weeks continuously, with no other ill effect than unpleasant eructations from the stomach; the leucocytes fell from 130,000 to 13,000 per c.mm. in five weeks; in the other case, however, albuminuria was produced almost at once, and the drug had to be stopped in three days.

Billings[11] records similar good results in five cases treated with benzol given in gelatin capsules oiled at the time of administration. One patient took the drug in an emulsion made up by the hospital druggist, of which two teaspoonfuls equalled 15 min. of benzol. The drug was given soon after meals and at bedtime. The dose at first was 7 min., which was soon increased to 15 min. All patients complained of eructation of gas, tasting and smelling of benzol. Burning in the stomach was a common symptom. Dizziness was a complaint of two patients. One patient left the hospital, and misunderstanding the order for the medicine, increased the daily dosage to 160 min. Within a few days he suffered from a severe toxic erythema and pruritus of the skin of the whole trunk and extremities. The drug was discontinued, and within one week the erythema disappeared. On resuming the benzol in the dose of 60 min. per day there was no further trouble. As a rule, the appetite was not disturbed, with one exception, and in this patient the general nutrition remained good. Of the other four, all gained in weight. No other medicine was given except the necessary laxative, or occasionally the mixture of rhubarb and soda as a stomachic. Generally the patients were kept at rest. The benzol used was that obtained by the hospital druggist, and an analysis was made for the presence of nitrobenzol or anilin. The urine of the patients was not examined for nitrobenzol or anilin. The urine did not contain a perceptible increase of uric acid during the rapid leucocytic destruction, nor was there general disturbance coincident with the destruction of the enormous number of leucocytes in so short a period.

The chief notable results of the benzol medication were a marked rise in the leucocytic count for a few days in two patients (in three patients this was not observed) ; a rapid fall in the number of leucocytes ; a correspondingly rapid diminution in the size of the spleen, much more rapid than with x-ray exposures alone ; an improvement of the red-cell count and hæmoglobin in all of the myelogenous types ; a rapid disappearance of the small though multiple lymph nodes in the patient with lymphoid leukæmia ; and marked general improvement in all. The x-ray treatment was applied at the same time, in all but one of the cases.

Kosler[12] records two cases in which, after x-ray treatment and arsenic had been tried without success, benzol given by the mouth led to extraordinary, even if only temporary, improvement. It is apt to produce diarrhœa and vomiting if the dose is pushed to more than a moderate extent, but some patients are able to take as much as a drachm of benzol per diem and continue with this for weeks at a time without any untoward effect upon the stomach, liver, or kidneys. Kösler recommends that chemically pure benzol should be mixed in equal parts with pure olive oil, the mixture being administered in gelatin coated capsules. Meyers and Jenkins[13] also report a case in which good results were obtained.

Jesperson[14] records a case in which the administration of benzol by the mouth was followed by remarkable improvement in a patient suffering from myeloid leukæmia that had reached an extreme degree, with profound emaciation, anæmia, and fever, before the treatment was begun.

Sohn[15] has carried out a series of researches with a view to determining what is the effect of benzol upon metabolism in the healthy body. He finds that it produces the same sort of alterations in the oxidation processes in the body, and in the metabolism of sulphur, as are produced by serious pathological conditions such as starvation, cancer, cirrhosis of the liver, chloroform narcosis, and acute phosphorus poisoning. He regards benzol as very liable to do damage to the liver, and probably other organs as well, and sounds a note of warning against its use in leukæmia except with the greatest caution.

Pappenheim[16] expresses the opinion that the action of either benzol or benzine on the bone-marrow and blood-forming apparatus is neither so elective nor so radical, nor so reliably constant, as is the effect of radio-active substances ; he does not deny that the action of benzol influences the blood, but he regards the blood changes as deceptive, and thinks the gastro-intestinal symptoms produced by the drug are due to a damaging effect upon the mucous membrane which is not free from danger.

References.—[1]*Wien. klin. Woch.* 1913, 509 ; [2]*Münch. med. Woch.* 1913, 1981 ; [3]*Quart. Jour. Med.* 1913, Apr. 293 ; [4]*Brist. Med.-Chir. Jour.* 1913, 10

[5]*Brit. Med. Jour.* 1913, i, 1318; [6]*Jour. Amer. Med. Assoc.* 1912, ii, 1435; [7]*Wien. klin. Woch.* 1913, 147; [8]*Ibid.* 357; [9]*Ibid.* 591; [10]*Deut. med. Woch.* 1913, 307; [11]*Jour. Amer. Med. Assoc.* 1913, i, 305; [12]*Wien. klin. Woch.* 1913, 838; [13]*Med. Rec.* 1913, i, 823; [14]*Deut. med. Woch.* 1913, 1300; [15]*Wien. klin. Woch.* 1913, 573; [16]*Ibid.* 48.

LEUKÆMIC ERUPTIONS OF THE SKIN.

E. Graham Little, M.D., F.R.C.P.

Nanta[1] reports a carefully observed case from Audry's clinique. The patient, a woman aged 54, showed much enlarged liver, spleen, and mesenteric glands, and generally enlarged superficial glands in the axillæ and neck. The general health remained but little impaired. The cutaneous eruption developed within fifteen days, and consisted of very numerous tumours, some as large as a tangerine, with macular, papular, vesicular, pustular, and nodular lesions. The latter were frequently surmounted with a vesicle or pustule, and were extremely itchy; some of them became ulcerated and crateriform.

The patient suffered much from the heat and from polyuria and polydipsia, as well as from pruritus; the latter was relieved by one treatment of *x* rays. Blood examination showed 21,700 white cells to 4,000,000 red; lymphocytes, 65 per cent; polynuclears, 17 per cent. Sporotrichosis, which was suggested by the ulcerated nodules, was excluded by bacteriological examination.

TREATMENT.—Besides the indications for treatment offered by the general disease, the principal cutaneous symptom is pruritus, which is sometimes excessive. Applications of **X-rays** are the best means of combating this.

REFERENCE.—[1]*Presse Méd.* 1913, 701.

LINITIS PLASTICA.—(*See* STOMACH, FIBROMATOSIS OF.)

LIPODYSTROPHIA PROGRESSIVA.

Herbert French, M.D., F.R.C.P.

This name is given by Parkes Weber[1] to a clinical condition, mainly confined to the female sex, characterized by progressive disappearance of the subcutaneous fat from the face, upper extremities, and trunk, whereas the fat of the lower extremities and gluteal regions remains unaffected or is increased in amount. In some cases, perhaps, the condition is one of pathologically altered distribution of fat rather than of genuine wasting, or possibly merely of relative excess of fat in the lower extremities and buttocks of an otherwise rather thin subject. Probably all degrees of this abnormal fat distribution occur, progressive in some subjects, and arrested or stationary in others, whilst in yet other cases the condition may perhaps occur as only a temporary feature in the life-history of a patient, or as little more than a slight exaggeration of a normal female sex character. In this connection it must be remembered that the development of subcutaneous fat is greater in the thighs and gluteal regions of the average human female than of the average male. The wasting of the face and upper part of the trunk first attracts attention, the wasting usually commencing in the face, neck, and upper part of the thorax, and spreading gradually downwards. In some of these latter cases, the onset of the wasting may be fairly sudden, and the disease may, for a time at least, be associated with anorexia, neurasthenic symptoms, and excess of knee-jerks and Achilles-jerks. The symptoms may commence in quite early life, at ten or thirteen years, or later on, up to between twenty and thirty years of age. The disease, though it seems (at all events in its most typical forms) to be confined to the female sex, does not appear to be connected with any obvious disease of the thyroid gland or ovaries. In a sense it might certainly be called a "trophic disease," but it is of uncertain origin, and no successful treatment has yet been discovered for it.

Weber has collected a number of illustrative cases from the literature, and points out that some at least of the cases recorded as bilateral facial atrophy have nothing to do with facial paralysis, and are probably examples of lipodystrophia progressiva.

REFERENCE.—[1]*Brit. Med. Jour.* 1913, i, 1154.

LIPS, SEBORRHŒIC KERATOSIS OF. *E. Graham Little, M.D., F.R.C.P.*

Sutton[1] describes this as a circumscribed, painless, pigmented, warty growth developing on senile skin or skin undergoing senile changes. A roughened, scaly, brown or yellow plaque is formed, which may persist for years, and may become epitheliomatous. Sutton reports seven cases, in five of which the same treatment was adopted, namely, application of **X-rays** (7 to 20 exposures, a medium tube at a distance of 15 cm., treatments of eight minutes at weekly intervals), followed by 5 per cent **Salicylic Acid Ointment**, and a final treatment for one minute under heavy pressure with **Solid Carbon Dioxide.** One case was treated with crystals of **Trichloracetic Acid.** The seventh case threatened a rapidly developing epithelioma and was operated upon.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1913, i, 1774.

LIVER, ABSCESS OF. (*See* AMŒBIASIS.)

LIVER, CIRRHOSIS OF. *Robert Hutchison, M.D., F.R.C.P.*

Davis[1] has had successful results from the use of a diet consisting mainly of **Milk,** combined with the administration of **Elaterium** ($\frac{1}{4}$ gr. three times a day for the first day, and afterwards every night). He is of opinion that a milk diet lessens dropsy and the tendency to hepatic toxæmia. He also gives **Urotropin** to disinfect the bile-passages. (*See also* SPLENOMEGALY.)

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1913, ii, 273.

LIVER, CYSTS OF.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

Non-parasitic cysts of the liver may, according to Boyd,[1] be grouped under two headings. (1) *General cystic disease* is generally associated with a similar lesion of the kidneys. The only surgical interest attaching to it arises from the fact, that in some cases the largest of the cysts has been dealt with by operation under the impression that it was a solitary one. (2) *Solitary cysts* are, as a matter of fact, not clearly distinguishable from the former condition; for in the tissue surrounding a "solitary" cyst, other minute cysts are commonly found; indeed, it has been suggested that both forms have a similar origin.

Apart from the development of a fluctuating swelling in the upper abdomen, which can generally be shown to be connected with the liver, there are no very characteristic symptoms. There may be a slight amount of pain in the hepatic region, and in several cases dyspepsia and vomiting were present. Jaundice appears to be rare.

Operative Treatment is indicated in all cases of apparently solitary cyst of the liver; and even when multiple cysts have been present, considerable relief has been afforded by treatment of the largest. If the cyst is superficial or pedunculated, resection is desirable; but if it is intrahepatic, incision and drainage, or partial resection with suture of the edges of the cyst to the parietes (marsupialization), is the safe proceeding. Boyd gives an extract of 33 cases from the literature and reports one of his own, the patient dying three months after operation from peritonitis after having the sinus syringed with hydrogen peroxide.

REFERENCE.—[1]*Lancet*, 1913, i, 734.

LIVER, FUNCTIONAL DERANGEMENT OF.

Robert Hutchison, M.D., F.R.C.P.

Baur[1] points out that comparatively little attention has been devoted to functional affections of the liver, the chief causes of which he summarizes as follows: dyspepsia, gastro-intestinal disturbance, alcoholic excess, rich and highly-seasoned food, fevers, nervous influences, and residence in the tropics.

TREATMENT.—The best method is to diminish the amount of work the liver has to perform, and to facilitate the circulation through it. The work of the liver depends chiefly upon the quantity and composition of the food; therefore in order to restore normal hepatic function there must be a limitation of the food-supply. But it must be borne in mind that too rigid a dietary may interfere with the nutrition of the liver cell, and thereby injuriously affect its activity. The restriction in the quantity of food should therefore be compatible with the maintenance of normal nutrition. A mixed diet is the best, the articles being of simple composition. Three meals a day are advised unless the gall-bladder is involved. Carbohydrates and fats should be limited, as the former tend to ferment, and the latter are not easily absorbed if the quantity of bile excreted is diminished. Alcohol should be forbidden. Other irritants such as mustard, pepper, red pepper, horse-radish, ginger, cloves, strong meat broths, large quantities of salt, and the empyreumatic substances that are formed in baking and roasting, should be avoided. In most cases it will not be necessary for the patient to exercise dietetic self-denial for more than a week. Rest after meals should be enjoined, so that the functional hyperæmia of the organ is not disturbed. Exercise such as golf is very important. With increased respiratory effort the liver is rhythmically compressed, and the venous blood flows more rapidly to the heart. For those unsatisfactory individuals who take little or no exercise, massage, general and special, is desirable.

Regarding drugs, he suggests a pill containing **Colalin** and **Iridin**, or **Podophyllin** and colalin, at bedtime, followed by a dose of **Sulphate of Soda** or **Carlsbad Salts** in the morning, for a week or longer. If the stools are clay coloured, **Calomel** may be substituted for either of the pills.

Reference.—[1]*Brit. Med. Jour.* 1912, i, 1117.

LIVER, FUNCTIONAL EFFICIENCY OF.

O. C. Gruner, M.D.

A number of observations have been made relative to this subject, among which the work of Strauss,[1] Hohlweg,[2] and Gouget[3] may be quoted. The various methods of studying the adequacy of the liver that have been employed in the past are:—

1. Estimation of the diminution of urea in the urine after administering ammonia and amino-acids. The objection to this is that urea is not made in the liver alone.

2. The appearance of ammonia and amino-acids in the urine. The objection to this is that the degree of excretion is dependent upon the variations of acidity of the organism as a whole.

3. Glaessner's test of giving amino-acids by the mouth and estimating how soon they appear in the urine. This test has been verified by Falk and Saxl and others.

4. Increased excretion of urobilin. The French authors consider that urobilin is the product of a diseased liver cell, and the extent of its appearance an index of the severity of the lesion.

5. The delay of appearance of camphor-glycuronic acid in the urine after giving camphor by the mouth.

6. The well-known levulose test. Hohlweg finds that there is much less tolerance for levulose when there is a stone in the common bile-duct, and also in catarrhal jaundice. This is valuable information for the differential diagnosis between urinary and gastric colic. There is no change in metastatic cancer of the liver, unless the bile-ducts are involved. Strauss gives an extensive analysis of the levulose test, being impressed with its value in diagnosis, and also advocates

7. The galactose test.

8. Certain indices: (*a*) Diminution of azoturic coefficient—$\frac{\text{Urea N}}{\text{Total N}}$—should be at least 80 per cent. (*b*) Elevation of the ammoniuric coefficient—$\frac{\text{ammonia N}}{\text{total N}}$—should be 2 to 6 per cent. (*c*) Appearance of amino-acids in the urine. (*d*) Arthus' coefficient, that of urogenic defect:—$\frac{\text{ammonia N}}{\text{ammonia N} + \text{urea N}}$. (*e*) Lanzenberg's coefficient of acidosis—$\frac{\text{ammonia N} + \text{amino-acid N}}{\text{ammonia N} + \text{amino-acid N} + \text{urea N}}$—on a milk diet

is 4·18; on meat diet 6·31. In cirrhosis and cancer of the liver, in diabetic coma and some cases of obesity, it is very much raised. Gouget further refers to the absence of a ferment in the blood that can reduce glycogen to glucose. This again is an indication of functional inadequacy of the liver.

REFERENCES.—¹*Deut. med. Woch.* 1913, 1300; ²*Münch. med. Woch.* 1913, 2271; ³*Presse Méd.* 1913, 214.

LIVER, SYPHILIS OF. *Robert Hutchison, M.D., F.R.C.P.*

McCrae¹ believes that tertiary syphilitic affections of the liver are commoner than is supposed. On the other hand, their recognition is very important, as they lend themselves remarkably well to treatment. From a careful study of fifty-six cases he concludes that syphilis of the liver presents a very varied clinical picture, with prominent general symptoms in many cases, of which loss in weight is marked. The duration of the symptoms may be prolonged, and there may be periods of improvement. Fever is a common occurrence. There are features suggestive of hepatic disease in the majority of the cases. Enlargement or tumour is the most common. This may suggest other conditions, especially malignant disease. General enlargement, and the occurrence of nodules or large rounded masses are the most usual. A striking feature is the relatively marked enlargement of the left lobe as compared with the right. The diagnosis may be obscured by other diseased conditions, or the liver condition may be interpreted wrongly. Ascites is sometimes a difficulty. Knowledge of the features of hepatic syphilis and the therapeutic test are important aids.

Treatment can influence the syphilitic process, but not its results (cirrhosis, amyloid). **Iodide of Potassium** alone gives splendid results, but it is perhaps wiser to give **Mercury** as well.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1913, ii, 62.

LOCOMOTOR ATAXY. (See SYPHILIS, CEREBRO-SPINAL.)

LUNG, SURGERY OF. (See also EMPYEMA; PNEUMOTHORAX, ARTIFICIAL.)

Priestly Leech, M.D., F.R.C.S.

Morriston Davies¹ has investigated Freund's suggestion that there is a close relationship between apical pulmonary tuberculosis and abnormal changes in the cartilage of the first rib. After a most painstaking research, he finds that neither abnormal shortness nor ossification in the first costal cartilage predisposes to apical pulmonary tuberculosis; abnormal shortness does not encourage its ossification, which is dependent on age and sex, and probably occupation. With increasing age there is increasing limitation of movement at the sternal angle; this, however, does not predispose to apical pulmonary tuberculosis. The presence of a groove in the postero-external aspect of the lung below the apex (Schmorl) is not the result of abnormal shortness of the costal cartilage, but probably of emphysema. The formation of a false joint in the rigid cartilage does not tend to lead to the cure of apical tuberculosis; so that the balance of evidence is therefore against the probability of benefit following such an operation.

The same writer,[2] in a very complete article, reviews recent advances in the surgery of the lung and pleura. It is impossible to do full justice to it in a short abstract, but attention may be drawn to the main points. Many think that the chief advance in this branch of surgery has been in the technique of operations on the open chest as illustrated by the discoveries of Sauerbruch and Brauer; but this is only applicable to a small number of cases. The result of progress in lung surgery has been the emergence of three main lines of treatment, which may be termed treatment by collapse, by consolidation and fibrosis (solidification), and by excision.

Treatment by Collapse is the most striking advance in pulmonary surgery, in that it is applicable to many pathological conditions, and is an entirely original procedure applicable to no other part of the body. Early and precise diagnosis is a *sine qua non* if treatment is to be satisfactory. When air is introduced into the pleural cavity, the oxygen is absorbed, but the nitrogen and carbon dioxide remain for a much longer period. When collapse of the lung for therapeutic uses is needed, as in phthisis, nitrogen is used, but when the object is to replace fluid and obtain expansion of a collapsed lung, oxygen is introduced. In phthisis, *nitrogen* may be used if the disease is unilateral, and also in some cases where there is slight disease in the other side, with enough healthy tissue to aerate the blood when the diseased side is put out of action. Caseating pneumonia and rapidly progressing miliary tubercle are not suitable for this form of treatment. The dangers are two, viz., nitrogen embolism, and "pleural eclampsia" or "pleural reflex." Nitrogen embolism is due to the needle entering the lung and gas escaping into a blood-vessel. The "pleural reflex" may be caused by the needle puncturing the pleura, by the introduction of nitrogen under excessive pressure in a part of the pleural cavity localized by adhesions which are thereby dragged on, or by the rupture of adhesions. Previous uneventful puncture of the pleura or rupture of adhesions, offers no guarantee that the reflex will not occur on a subsequent occasion. The phenomenon manifests itself usually as a syncopal attack, with partial or complete loss of consciousness, marked restlessness, pallor, and disappearance of the radial pulse. The symptoms usually disappear in a few minutes, but death may ensue. To avoid "pleural reflex" the parietal pleura should be anæsthetized with novocain; gas embolism may be avoided by using a water manometer. Sepsis and pleural effusion are other additional dangers. The results in phthisis have been encouraging, but the treatment must be continued for a year, and fresh nitrogen introduced every two or three months.

It has been known for some time that the aspiration of fluid from the pleural cavity is not devoid of danger, and that even after an apparent complete withdrawal of fluid there is still a good deal left at the base. Morriston Davies has shown that if, during paracentesis, whenever there is the slightest symptom of distress, 100 c.c. of *oxygen* are allowed to flow in, the distress ceases; the whole of the fluid can be removed, and the lung can be cleared so as to permit of complete radioscopy and radiography. The aspiration is done with the ordinary apparatus, and the hollow needle for the gas is connected with the same apparatus that is used for producing a pneumothorax in phthisis, but filled with oxygen instead of nitrogen. The needle must have a bore of at least 1 mm., in order that the intrapleural variations of pressure may be transmitted through the fluid which surrounds its opening. The cannula for aspiration is introduced into the lowest accessible part of the fluid, and the needle connected with the oxygen some two interspaces higher up. The fluid is drawn off until the first indication of discomfort to the patient is noticed, when the aspiration is instantly stopped and 100 c.c. of oxygen are slowly allowed to flow into the pleural cavity. Aspiration is then renewed, till a slight degree of pain or cough indicates that another 100 c.c. of oxygen must be let in. This sequence is repeated until the aspiration sucks out oxygen alone, when a final 100 c.c. of oxygen are run in to lower the high negative pressure.

Mechanical Control of Open Pneumothorax.—Opinions vary as to the advantages of the hyper-atmosphere (*Ueberdruck*) and hypo-atmosphere (*Unterdruck*) methods of differential pressure. Morriston Davies thinks that the Sauerbruch chamber with its negative pressure (*Unterdruck*) reproduces more nearly the normal physiological conditions. Meltzer has introduced the "insufflation" method, which is applicable for all operations, and not only for those in which the pleura is opened. In this method, air at a pressure above that of the atmosphere, and mixed with anæsthetic, is administered by a catheter which passes down the trachea to a point immediately above its bifurcation, while the escaping air passes out between the catheter and the sides of the trachea and glottis.

Choice of Method of Anæsthetization for Operations on the Thorax.—(*See also* ANÆSTHETICS). The opening and draining of an empyema, the removal of ribs for bronchiectasis or chronic empyema, the "Pfeiler-Resektion" of Wilms for tuberculosis, the removal of costal cartilages for bronchitis and emphysema, or for the opening of a pericardial effusion, should all be done whenever possible under regional or local anæsthesia with novocain. For more extensive intrathoracic operations, intravenous ether anæsthesia offers many advantages, and when using the hyper-atmospheric apparatus, Davies considers this method preferable to all others. For inhalation anæsthesia, chloroform is the least irritating, and should be used in preference to ether.

Empyema.—In acute cases which do not close, the expansion of the lung proceeds much more rapidly under the influence of aspiration than by the use of ordinary methods. In *chronic empyemata* the operations of Schede, Estlander, and Delorme, and Wilms' "Pfeiler-Resektion," are all useful. The treatment of fistula by means of bismuth paste is falling into disuse, owing to the number of cases of poisoning which have occurred. For radiographic purposes a 20 per cent solution of collargol is quite efficient and is non-toxic. In cases of calcification of the pleura, unless the calcified plates give rise to symptoms, they should be left; but if operation is undertaken, they must be completely removed, otherwise a chronic sinus will develop.

Injuries of the Lung.—In crushes or blows without fracture of the skeletal part of the thorax, lacerations with or due to fracture of ribs and sternum, and penetrating wounds (bullet or stab), it is becoming increasingly obvious that conservative treatment, when efficiently carried out, gives the best chance of recovery. The indications for interference are severe intrathoracic bleeding which increases in spite of palliative measures and absolute rest, or, if arrested, is repeated; and progressive mediastinal emphysema. During operation the pneumothorax must be controlled by some form of differential pressure mechanism; the pleural cavity is emptied of clot; wounds in the lung are stitched up with catgut, but extensively damaged portions must be removed. Drainage is inadvisable. Absolute rest is a *sine qua non* in the treatment, and it must be taken in its most literal sense, as the slightest movement may accelerate the hæmorrhage or re-open a closed vessel. Morphia should be given freely to quiet the patient.

Foreign Bodies in Lower Air Passages and Lung.—Removal by the bronchoscope is the method of choice; its failures may be due to secondary changes in the bronchus and adjacent lung tissue, or to the depth to which the foreign body has been inhaled. In the latter case operation is indicated. The extra-pleural part of the bronchus may be reached through a posterior incision, the lung and pleura being displaced outwards. If the body is in the lung itself, transpleural pneumotomy must be tried.

Abscess of Lung.—Statistics show that the mortality of this disease is 80 per cent if left untreated, while after operation it varies from 34·5 to 17·5 per cent. It has been much lower lately, thanks to advances in radiology and the diminished danger of opening the chest in the absence of adhesions by the use of a differential pressure apparatus. As regards operation, the route of approach is determined by the position of the cavity, as shown by clinical and radiological examination; the pleura should be exposed over a wide area, preferably by the formation of a flap, and the ribs underlying this should be removed, so that the chest wall will be more yielding, and will help to obliterate the cavity. If the pleuræ are not adherent, the parietal should be sewed to the visceral pleura. Some surgeons do the operation in two stages, waiting for firm adhesions to form before opening the cavity. Discovery of the abscess is difficult unless the lung has been palpated. Exploration with needle and syringe is justified only after the pleural surfaces have been united. If pus is found, the needle is left *in situ* and an incision made along it. If pus is not found, a gradually deepening crucial incision is made, the vessels being ligatured as soon as cut. If the abscess is not discovered, the wound should be plugged with gauze in the hope that it will burst into it. When it is found, the edges of the cavity should be stitched back and gauze plugging used. Secondary hæmorrhage may occur; this must be treated by packing with gauze and morphia. If empyema is associated with the abscess, the prognosis is very grave. The empyema must be treated first, and then the abscess.

Solidification of the Lung is the basis of the surgical treatment of bronchiectasis and tuberculosis. The methods of producing this are: (1) Temporary collapse by introducing nitrogen into the pleural cavity; (2) Production of permanent consolidation of (*a*) part of the lung by rib resection, division of the phrenic nerve, or ligature of the pulmonary artery; (*b*) of the whole lung by resection or mobilization of rib. In bronchiectasis all have been tried, and a bronchiectatic lobe has been amputated several times. The mortality of extensive rib resection is high and the cures are few. Sauerbruch has ligatured a branch of the pulmonary artery seven times, with most encouraging results. Wilms' operation of rib mobilization ("Pfeiler Resektion") is used for cases of pulmonary tuberculosis in which the intrapleural collapse of the lung is impossible. The principle of the operation is the removal of portions (2 to 3 cm.) of the posterior ends of the upper seven or nine ribs, and of the costal cartilages of the first five or six ribs, the essential feature being the mobilization of the first rib: unless this is done the operation is valueless. In streptothricosis and in new growths of the lung, surgery may intervene in some cases with success: Davies reports one case which went well for six days till an empyema developed which was fatal on the eighth day.

He found infiltration of the vagus with novocain very useful.

A good deal of discussion has taken place as to the treatment of *penetrating wounds of the lung*. Von Kutscha[1] discusses the whole subject, and reports four cases in the hospital at Vienna. All were operated on, and three recovered; one was diagnosed as a wound of the heart. The diagnosis as to whether the lung is wounded or not is very difficult and often impossible. The clinical symptoms are dullness of the lower part of the thorax, pneumothorax, emphysema of the skin, hæmoptysis, difficult and quick respiration, and the general signs of anæmia; but all these symptoms may be due to an increasing pneumothorax. Hæmoptysis may not be present even with a bad wound of the lung. His conclusions are that serious hæmorrhage and collapse of the lung in consequence of a pneumothorax justify an operation even without differential pressure. If operation is done, a sufficiently wide opening in the thorax must be made, and the wound in the lung must be stitched before a pneumopexy or artificial inflation of the lung is carried out.

Kellock[2] reports a successful case of pneumotomy for a shawl pin in the lung of a child, aged 4½ years. The pin was about two inches long; the skiagram showed it at the level of the third rib on the right side, apparently in the right bronchus, with the point upwards. The day after admission several attempts were made to remove the pin through the bronchoscope, but although the forceps grasped the pin it could not be lifted away. Later the skiagram showed the pin to have travelled nearly to the diaphragm. The technique was as follows: A square

4-inch flap was made consisting of skin and superficial muscles, and reflected backwards; the edges of the flap were parallel to the direction of the ribs, the posterior ends of the upper and lower incisions reaching to within an inch of the middle line of the back, the marks of localization being used as guides as to the level at which to open the chest. Four of the ribs were divided subperiosteally at the anterior part of the wound. The deep muscles of the back were thus retracted towards the middle line, and the same ribs were cut with bone forceps as far back as they could be reached, the forceps being passed close above and below the bones. The intercostal muscles and ribs were divided along the anterior ends of the cut ribs in the whole length of the wound, and above and below the divided ribs, and the flap turned backwards, a window about 3 in. square being thus formed. The diaphragm bulged up into the wound and was kept down with a flat retractor. With a finger passed between the lung and diaphragm it was thought that the pin could be felt. Two silk sutures were passed through the edge of the lung to hold it in position against the chest wall, but they were not of much use. An incision was made over the place where the hard lump was felt, but when any attempt was made to introduce the finger, the lung receded. Two fingers of the left hand introduced into the sulcus between the middle and upper lobes of the lung pulled the lower lobe outwards and steadied it, and the needle was then easily felt and extracted. The wound of the lung was closed by a silk suture, and the two flaps sewn in place, with a small drainage tube at the anterior inferior angle passed down to the wound of the lung. Very little discharge came from the tube, and it was not offensive after the second day. The child had coughed some offensive matter up, and a small quantity of offensive pus had escaped when the lung was incised.

REFERENCES.—[1]*Brit. Jour. Surg.* 1913, July, 55; [2]*Ibid.* Oct., 228; [3]*Wien. klin. Woch.* 1913, 737; [4]*Lancet*, 1913, i. 92.

LUPUS ERYTHEMATOSUS.

E. Graham Little, M.D., F.R.C.P.

ETIOLOGY.—MacLeod[1] dwells especially on the varieties, nature, causation, and treatment. Clinically, the two types of discoid or fixed chronic patches, and the acute disseminated form, are to be distinguished. It is possible that these may really be distinct diseases, for the impression found much support in the subsequent discussion, that lupus erythematosus is not a single entity, but that "persistent erythema succeeded by atrophic scarring" which may be regarded as the essential features of the affection, may be the result of many different causes. MacLeod, in common with most dermatologists, rejects the tuberculous hypothesis, and inclines to the view that other toxins than tuberculous are more often the determining factor. The similarity of the symptoms, especially of the acute variety, to those of erythema multiforme, is an argument for a similar causation, and the histological characters of the two diseases are also similar.

The causes are *predisposing* and *direct*; under the former heading, adults almost exclusively are affected, more especially between the ages of 20 and 40; it is three times as common in women as in men; a defective peripheral circulation is almost the rule, and may be the result of anæmia, heart disease, tuberculosis, or rheumatism. Of the *direct* causes, toxins of unknown nature, but possibly derived from the intestinal canal or from disordered visceral functions, are assumed to play the chief part, aided by local factors determining the incidence of the lesion, e.g., frost-bite, cold, insect-bite, sunburn.

Hartzell[2] has recorded and collected a series of cases of lupus erythematosus *in association with Raynaud's disease*. He considers this relationship may best be explained by supposing both to be due at times to a common cause, most probably a toxin circulating in the blood, which acts primarily upon the vessel walls, producing vasomotor and inflammatory changes in the skin and subcutaneous tissues. Erythematous lupus should therefore be regarded as a toxic erythema.

TREATMENT.—This, says MacLeod, must vary with the type of disease present. Active local interference with the acute variety should never be attempted; in these cases, fortunately much less frequent, internal antitoxic agents such as **Quinine, Salicin,** and **Ichthyol** are chiefly relied on, and the patient should usually be kept in bed. In the discoid or fixed type local treatment may be properly undertaken, and the author prefers **Ionization with Zinc Salts,** a 2 per cent solution of zinc sulphate with a current of 2 to 5 milliamperes for fifteen minutes at a sitting being recommended. Freezing by **Carbon Dioxide Snow** should be used only for the fixed chronic patches, and exposures of only 5 to 10 seconds with medium pressure used. *X* rays, radium and Finsen are usually disappointing in their results. Various lotions and powders are also useful, especially in reducing hyperæmia; thus equal parts of **Zinc Oxide** and **Magnesium Carbonate** may be dusted on the inflamed area; or **Calamine Lotion** or **Lassar's Paste** with or without ichthyol may be applied. **Collodion Flexile** with 1 per cent **Salicylic Acid,** applied several times a day, mechanically reduces congestion. In the subsequent discussion, Wild suggested the use of **Iodide of Mercury** $\frac{1}{16}$ to $\frac{1}{32}$ gr. dissolved in water with 3 to 5 gr. potassic iodide, and given three or four times a day in the acute variety of the disease. In very chronic cases Pernet was satisfied with the advantages of **Multiple Galvano-puncture** as recommended by Sabouraud. Winkelried Williams, considering the incriminated toxins to be usually of alimentary origin, deprecated the use of powerful hydragogue purgatives, which might release an overdose of the toxin from the fæcal content of the bowel. [See also SKIN, GENERAL THERAPEUTICS OF.]

REFERENCES.—[1]*Brit. Med. Jour.* 1913, ii, 313; [2]*Amer. Jour. Med. Sci.* 1913, ii, 193.

MALARIA.

Leonard Rogers, M.D., F.R.C.P.

S. R. Christophers[1] has made a notable contribution to the vexed question of the *description and classification of anophelines*. He has carefully studied the variations in their colour marking, including that of the wings, antennæ, and legs, and compared these with the male characters on which Theobald mainly based his classification. The two agree fairly closely, and a scheme of phylogenetic arrangement, showing gradual elaboration of ornamentation and scale development, is worked out. This again is shown to correspond in a general way with the geographical distribution, and thus appears to be of distinct scientific value. Finally, an elaborate table, showing the grouping of species of anophelinæ according to colour and markings and other variable characters, is given. The paper is illustrated by good plates, but the detailed character of the analysis does not lend itself to further abstraction.

D. Thomson[2] has continued his numerical *blood examinations* in malaria. He finds a decrease of leucocytes during malaria, but during early convalesence they may be slightly increased, which he thinks is due to the presence of very small numbers of parasites. This is supported by the counts after injection of certain numbers of dead parasites. Crescents gradually become reduced, and usually disappear within three weeks if 20 gr. of quinine are given daily, by which means further formation of crescents is prevented and they die out. He thinks the ideal method of quinine prophylaxis would be to give such doses for three weeks in each quarter of the year to the whole population in malarious places, children receiving proportionately smaller doses, and he suggests that this plan would be preferable to 5-gr. doses daily throughout the year.

T. F. G. Mayer[3] describes and figures a mosquito- and storm-proof house for the tropics, and especially for West Africa. It is made by Messrs. Humphreys, Ltd., of Knightsbridge, of steel with a minimum of wood. In order to allow of some breeze, there are no walls or partitions within the house, the occupant using screens and curtains for dividing the space.

Cultivation of the Malarial Parasite.—C. C. Bass and F. M. Johns,[4] of the Tulane (New Orleans) School of Tropical Medicine, have made the important discovery of a simple method of cultivating the malarial parasite. Ten c.c. of blood are withdrawn from a vein and defibrinated, and 0·1 c.c. of a 50 per cent solution of dextrose is added. This is incubated in a tube containing a column at least two inches in depth at not less than 40° C., preferably at 41° C. There should be at least half an inch of serum above the corpuscles after the blood has settled. The parasites are found in the upper one-fifteenth to one-twentieth of an inch of the corpuscle layer. If a second generation is to be grown, the leucocytes must be removed by the centrifuge, or the extra-corpuscular spore forms will be destroyed, and the subculture should be made within six hours of sporulation. By this means four generations have been obtained. All three forms of malarial parasites have been grown, the organisms increasing in size and segmenting, and the young forms entering fresh red corpuscles. The asexual cycle does not differ in culture from that in the human subject, but the sexual stage has not yet been obtained in the culture tubes. The temperature greatly affects the growth, which is much slowed by several degrees below the optimum, when the tertian variety may take as long as four days to complete the cycle. Some forms suggesting parthenogenesis have been observed. J. G. Thomson, D. Thomson, and H. B. Fantham[5] have partially confirmed Bass's observations by cultivating one generation of benign tertian parasites up to the stage of sporulation from young ring forms. The maximum number of spores was sixteen. H. Ziemann[6] also obtained undoubted development of the tertian malarial parasite by Bass's method.

Mary Rowley Lawson[7] deals with the relationship of the malarial parasite to the erythrocyte, and thinks that it is attached to the outer surface and not intra-corpuscular.

A. Balfour[8] records a further year's anti-malarial work at Khartoum with an illustrative map. A vigorous mosquito crusade was maintained, but difficulties arose owing to the fall of the river leaving sandbanks with numerous pools which were difficult to deal with. Moreover, the mosquitoes were found to travel longer distances than was formerly thought; and he now concludes that in future it will be absolutely necessary at low Nile to include within the inspection area a point at least two miles from Khartoum as the crow flies. Trains were found to carry the insects on a considerable scale, as well as steamers and boats. Half the annual malarial prevalence occurred in September. No benign tertian cases were met with. **Sanitas-okol** was found best as a larvicide. For fumigating ships **Cresyl** was employed. Mosquito traps were used in houses.

N. P. O'Gorman Lalor[9] describes and illustrates in colours what he considers to be spore forms incorporated in the nucleus of large mononuclear cells, which he observed in malarial fevers in an area of Burma in which blackwater fever occurs.

J. M. Woolley[10] describes, under the head of malaria, a fatal form of fever with marked jaundice in which he found no malarial parasites. It occurred in the Andaman Islands, and may, he thinks, prove to be a new non-malarial fever. The symptoms closely resemble those of malignant jaundice accompanied by hæmorrhages, and the death-rate was 40 per cent. Quinine was useless in the treatment.

J. M. Atkinson[11] found the presence of traces of *urobilin* in the urine, as demonstrated by Schlesinger's reaction, of great diagnostic value in malarial fever, even when parasites could not easily be found in the blood. The test can be rapidly performed. It may also occur in liver abscess, etc., but a negative result speaks strongly against acute malarial fever. Schlesinger's solution consists of zinc acetate 1 part, alcohol 10 parts. An equal quantity is added to urine in a test-tube after being well shaken. A few drops of a weak solution of tincture of iodine are added, and the mixture filtered, when a more or less distinct fluorescence indicates a positive reaction.

J. P. Bates[12] deals with malarial anæmia. He confirms Dionisi and others in finding a rapid loss of red corpuscles, followed in chronic cases by a considerable rise in the numbers, due to tolerance to the toxins. Insufficient food, or the presence of hook-worms, greatly intensifies the anæmia. The term malarial cachexia is misleading and ought to be dropped.

E. Marchiafava[13] deals with pernicious malaria, all of his cases from 1885 onwards having been due to malignant tertian parasites, and never to benign tertian or quartan. The cases are fresh primary infections with soft spleens, and the parasites increase rapidly until there may be more than one ring in each corpuscle. Quinine in full doses, either subcutaneously or even intravenously, may often fail to avert death, the parasites being very resistant and showing irregular development, the end being due to the central nervous disease. Healthy workers in malarial regions should take quinine from the very first symptom, the blood being frequently examined in doubtful cases, Ross's thick film method being useful.

TREATMENT.—H. Werner[14] finds both **Salvarsan** and **Neosalvarsan** effective against benign tertian malaria, but not against the malignant tertian form. E. E. Waters[15] has used **Amorphous Cinchona Alkaloid** with success in malaria. This is a mixture of amorphous alkaloids of cinchona bark, which was named quinoidine by Seturner as long ago as 1830.

REFERENCES.—[1]*Ann. Trop. Med. and Hyg.* 1913, 45; [2]*Ibid.* 1912, 215; *Ibid.* 1913 223; [3]*Ibid.* 1913, 41; [4]*Jour. Exper. Med.* xvi, 567; [5]*Ann. Trop. Med. and Hyg.* vi, 449; *Ibid.* vii, 153; [6]*Deut. med. Woch.* 1913, 260; [7]*Jour. Exper. Med.* 1913, No. 3; [8]*Jour. Trop. Med.* 1913, 225; [9]*Ind. Med. Gaz.* 1913, 253; [10]*Ibid.* 266; [11]*Lancet,* 1913, i, 1802; [12]*Jour. Trop. Med.* 1913, 209; [13]*Deut. med. Woch.* 1913, 1577; [14]*Deut. med. Woch.* 1912, 2068; [15]*Ind. Med. Gaz.* 1913, 80.

MALINGERING. (*See also* EAR, DISEASES OF.) *Sir John Collie, M.D.*

What is Malingering?—A recent author has described a malingerer as "one who feigns sickness, or who (deliberately, knowingly and wilfully) induces or protracts an illness with the object of evading duty, claiming money compensation, exciting sympathy, or from any other reason."

Necessity for Detection of Malingering.—Many serious errors in diagnosis are made in ordinary practice, not from ignorance, but because the disease which has been missed is one which is either rare, or seldom met with by the practitioner concerned. It is in this sense only that malingering is difficult to diagnose. In ordinary practice, until the present time, simulation of disease has been practically unknown; but most of us—at any rate those who have panel patients—must, if justice is to be done, be keenly alive to the possibility of patients remaining unduly long on the sick list. It is unfortunate that an atmosphere of suspicion, however impalpable, must be sometimes present when dealing with the insured. Nevertheless, those who have panel patients must safeguard themselves from the many pitfalls which the malingerer prepares for the unwary.

The temptation to remain long on the threshold of work must in many instances be very great. Many working men when ill receive from various clubs a sum equal to, if not greater than, that which they earn when well; and when the National Insurance Act adds to this another 5s., 7s. 6d., or 10s. as the case may be, it is not difficult to understand why certificates of sickness should be greatly sought after. It is only fair to say that, even in the working classes, some men and many women are unduly introspective, and in dealing with them, that practitioner who best understands the environment of his patient, makes due allowance for psychical conditions, abandons rule-of-thumb method of giving drugs, and substitutes for it the modern method of psychotherapeutics, will have fewer tussles with exaggerated or so-called fraudulent claims.

The Medical Examiner.—In the detection of malingering the mental equipment of the examiner is one of the most important factors; he must be open, frank, and fearless; he should be kind yet firm. Unless he is alert beyond all telling, and possesses, as most medical men do, a wide knowledge of human nature, he is not likely to be very successful.

General Conduct of the Examination.—The examination often resolves itself into a battle of wits; the examinee has usually had an opportunity of carefully thinking over and planning his method of attack, whereas the medical examiner is only too often in the position of defendant. Always watch a patient when he is entering the room; carefully observe him when he is undressing and dressing, but do so if possible unobservedly. When the patient tells the story of his wrongs and his pains, always tie him down to a definite statement. Speaking generally, the more indefinite a patient's statement is, the more suspicious the case. There are obviously many and wide exceptions to such a general proposition; but in dealing with those who are malingering or exaggerating, I am confident from a very large experience that it is wise to be suspicious of those who will not tie themselves down to a specific statement of their complaints. Observe carefully, therefore, the definiteness or indefiniteness of his allegations of pain and disability. It is a wise precaution to note these in writing at the time, if possible in his own words.

Much may be gained from making a tentative suggestion with regard to return to work. I am always suspicious of the man who, in a hopeless way, will give no idea of when he expects to be able to return to work, and, as far as I am concerned, it never assists his case if he adds, as such people frequently do, that he will return to work when his own doctor says he is fit for it.

The physical examination of a patient for the detection of malingering can follow no set rules. The sequence of each case can only be learnt, and the difficulties met as they arise, by experience. Speaking generally, the simplest methods are the best. Straws show how the wind blows. I have often exposed a fraudulent limp by a careful examination of the soles of the boots. One cannot limp persistently without causing some difference in the wear of the sole of the boot. The late Dr. Rose tells the following story. He was detained for some considerable time in an anteroom whilst the patient whom he was about to examine for an insurance company was being prepared for his visit. He noticed a pair of boots on the floor, and, suspecting that the claimant was really undressing and getting into bed, asked if they were his, and putting his hands into them found they were warm!

Thoroughness is the keynote of every examination. Never forget that during the short half-hour in which the patient is being examined, the medical man's reputation may be made or marred, and that facts then ascertained, or points missed through want of thoroughness, may come up in judgment against one before lay committees or in courts of justice. My advice to anyone who has not the time to do this work thoroughly is, very emphatically, not to do it at all, not only for the sake of those who employ him, but for his own sake. If in doubt, every modern method of examination should be resorted to before an opinion is formed. The author makes it an invariable rule to have all difficult cases *x*-rayed before forming an opinion. One must not forget that if this be omitted, the medical man who is supporting the claimant may do it, to one's own discomfiture. A single *x*-ray photograph of, say, a joint, is comparatively valueless; the corresponding joint should, if an abnormality be found, always be *x*-rayed for the purpose of comparison.

Stiff and Painful Joints.—It is often exceedingly difficult to get patients to relax their muscles for the thorough examination of a joint. A little time spent upon the sound joint in showing the patient exactly what is required is sometimes of much value. It is often useful to explain to a patient that the mere process of keeping a joint stiff involves muscular action, and that by examining the muscles in the neighbourhood of the joint the examiner can, in fact, tell by their hardness whether these are being brought into play. An old lady who had been wearing a knee splint for many weeks declared very emphatically that she could not bend the knee. She was unmasked by the simple process of engaging her in an animated and interested conversation as to the details of the accident, and suddenly asking her to remove the boot of the foot on the afflicted side. She saved me much trouble, and entirely gave away her case, by unconsciously bending her knee and removing her boot in the ordinary way.

If it be a joint that is alleged to be painful, by absorbing the patient in interesting conversation (I generally choose such a subject as the notice he gave at the time of the examination, the number of witnesses who were present, etc., surely a legal, and not a medical matter!), a gentle and gradual movement of the joint will often betray the fact that it can be moved painlessly. I well remember a case of a healthy man who had fractured his clavicle some three months before, and who was living comfortably upon the funds of an insurance society. He had for many weeks convinced his doctor that he was absolutely unable to raise his arm above a right angle with his body. A somewhat limited examination convinced me of the falsity of his statements. It was, however, a matter of the greatest importance that I should be able also to convince his medical attendant. The patient was told in a casual way to strip to the waist, and to my amusement, and I confess satisfaction, he removed a somewhat tightly fitting undervest in the same manner and with the same alacrity that most show in taking off a jersey after a football match.

When examining a patient's capacity to raise his arm above his head, his attention should be directed away from his alleged injured shoulder or arm, on the pretext of examining his back; his hands should be placed resting lightly on the back of a chair; he should be induced to step backwards gradually away from the chair, his back being thus straightened and his arms extended until he is in practically a horizontal position. His hands are now actually high above his head, although he may not realize this until he is suddenly told to stand upright in front of an adjacent mirror, without being allowed to move his arms.

A useful test for alleged weakness of the arm or shoulder is as follows: The patient is induced to hang by both hands from a small trapeze which is attached to the ceiling of the consulting-room and suspended above the ground by means of a block and tackle. In case it should be contended that he holds to the trapeze by the strength of the unaffected limb, a cross-bar is taken and placed loosely through the triangle of the trapeze, and he is instructed to hold on to each end of the cross-bar. He is then again lifted off his feet. If he is not able to use equal strength with both hands, this is at once apparent, because the loose bar at once slips sideways through the triangle. When the loose bar is maintained equably, the patient should then be weighed, and one is able to state that he can suspend half his weight, whatever that may be, with the alleged injured limb.

Many of the examples described are explained in fuller detail in my book.[1] The following is an interesting quotation: "The patient tried to make one believe that when the fist was closed the ring finger could not be closed as tightly as the other fingers, and that there was no power of grasp in that finger. He appeared to be a curious mixture of simplicity and artfulness, and it was some time before I was able to prove that he was affecting a disability which did not exist. On being requested to lift by the semicircular handle a gypsy coal-scuttle weighing 28 lb. he at first refused even to try, but after considerable insistence was persuaded to make a serious effort. He complained that the brass handle hurt the front of the ring finger. After the handle had been covered with cotton-wool, he was induced to hold it up with the ring finger alone, but even then declined to try to lift the scuttle off the ground. I said we would try it together, and applying both my hands to his forearm, whilst he kept the ring finger acting as a hook, we pulled together, lifting the scuttle off the ground. It is obvious that my assistance was merely a pretence, inasmuch as, although I did help to pull, I could not possibly help him in keeping bent the ring finger, upon which the whole weight was suspended. His remark after this performance, 'But you helped me,' showed that he had been deliberately pretending incapacity. Six weeks later, as the applicant did not appear at the hearing, the Judge terminated the compensation, but it was arranged that the case might come on again for trial a fortnight later. Meanwhile the applicant was said to have heard of a job, which he decided to take, and abandoned his claim three days before the date appointed for the further hearing."

When a man complains of continuous pain in the neighbourhood of a joint as the result of traumatism, one thinks of synovitis or osteoarthritis. Both these conditions are accompanied by wasting of the muscles, with a reflex nervous action. A well-clothed muscular joint said to be stiff, and the condition reported as having lasted for many weeks, would on the face of it make one very suspicious. Not unnaturally one has the impression that a man is himself a better judge of the amount of pain he suffers than even his doctor, and it is very difficult to deny the existence of pain when a patient alleges repeatedly and positively that it does in fact exist; but not infrequently one is driven to judge to a large extent by outside circumstances.

Sciatica is often complained of, either without any basis of fact, or when it has long since passed off. In the case of a man who alleged this disability, I bared his leg, flexed his ankle, and held his foot a little way from the ground, keeping the knee straight, and asked him to say whether he felt a pin prick on the inner or outer side of the foot. His attention being thus distracted, I gradually brought the foot higher and higher, still keeping the knee straight, until his leg was in a position in which the sciatic nerve was considerably stretched. He made no complaint of pain along the course of the sciatic nerve, which he must inevitably have done had there been any sciatica present. I then told him what had been taking place, and proceeded to flex his knee and raise his leg upwards towards the abdomen. Now in this position the sciatic nerve is not stretched, inasmuch as the knee is bent. But he in his ignorance of anatomy thought I was again stretching the nerve, and at once called out as if in pain.

Congenital Asymmetry.—I have had a few cases in which, after a slight accident, disability has been alleged for long periods of time, out of all proportion to the severity of the original traumatism, and where the contention of incapacity is supported by the exhibition of a limb which is obviously less muscular than the corresponding one, a suggestion which is supported by the tape measure. The condition is a somewhat embarrassing one to deal with. When this is found both in the upper and lower extremity on the same side, and when the patient complains, as so frequently he does, of loss of muscular power on that side, a diagnosis of paralysis is almost invariably made, and this is frequently asserted to have been caused by an injury to, say, the shoulder, back, or even a limb. If careful measurements are made, many of these cases will be found to be suffering from congenital asymmetry, and the accident has merely brought into prominence a condition which the patient was either totally unaware of, or to which he paid little heed until it was discovered that it had a latent monetary value.

Congenital asymmetry is much more common than is supposed. Careful, accurate, systematic measurements by means of an ordinary tape measure are important. The value of these, however, depends upon whether the corresponding limb on the other side of the body is also measured for comparison. Young found 70 per cent of unequal limbs, the greater majority being larger on the right, and in his measurements he excluded those having obvious disease such as flat foot, coxa vara, infantile paralysis, and so forth. The condition is supposed to be hereditary. It may be that its origin is connected with a difference in size of the main artery of supply of the limb. But the lesson is that it is of the greatest importance to take careful circumferential measurements of the limbs at different spots, and also the following: from the sternal notch to the internal malleolus on both sides, from the sternal notch to the anterior superior spinous process on the right and left, and from the anterior superior spinous process to the internal malleolus. When these are set out in diagrammatic form, a surprising result will often be obtained. Tubby, in his "Abnormalities, including Diseases of the Bones and Joints," has gone into this matter very thoroughly.

Loss of Sensation is a symptom frequently complained of. A woman who suggested that as the result of injury she had lost sensation in her left leg, was asked to bare both legs, and her eyes were covered with a handkerchief. I then pricked her right leg with a pin, asking her to say "Yes" every time I did so, and she followed this instruction. I then told her to say "No" every time I touched her left leg, in which she had stated there was no sensation. More than a dozen times I pricked each leg alternately, and she at once responded "Yes" to the right and "No" to the left. This was fairly conclusive evidence that she had sensation in both her legs.

Examination of the Back. A stiff painful back is a usual complaint both with the out and out malingerer and the man who labours under an obsession to this effect. When disease exists in the spine, the first thing that nature does is to prevent movement and pain consequent upon it between each individual vertebra. In the case of a man who absolutely declined even to attempt to bend his back at the commencement of the examination, I induced him later to touch his toes several times; each time putting the points of my fingers between the spinous processes of the vertebræ which were supposed to be stiff. It was found that as he assumed the erect position they moved freely one on the other. No disease, inflammatory or otherwise, was present over the alleged painful area, for if there had been the vertebræ would not have glided upon each other each time he stood erect.

Another man persistently kept his back curved forward and stated that he was quite unable to straighten it. Such a disability, if genuine, would certainly cause much pain if the back were forcibly straightened, and would indeed be indicative of serious spinal disease. During the examination he was induced to strip, and asked to lie flat upon a long sofa. He did so with very little protest. Part of his clothes were then taken and rolled up in a good-sized bundle and placed under the small of his back, thus actually arching his back in exactly the reverse position to that in which he stated he was obliged to hold it when walking. Still he made no complaint.

The painful back, the old "railway spine" of Erichsen, and the "concussion of the spine" of modern times, is, in ninety-nine cases out of a hundred, not a physical condition, but a neurosis born of much morbid introspection, aided and fostered by covetousness. No one knows better than the working man the difficulty that we doctors have with subjective sensations, and especially when these are referred to so complicated a structure as the spinal column. "When yer gets 'urt, say it's yer back; the doctors can't never get round yer back." A working man told my friend the late Dr. Biss that he had received this advice from a comrade prior to medical examination.

There are many physical signs which can be elicited when there is disease of the spinal column. For instance, if when the patient's pelvis is fixed, and he is asked to move from side to side, he does so without complaint, it goes a long way to prove that there is no disease of the spinal bones. A test of like import consists of inducing him, under pretext of examining first his right and then his left ear, to twist his head, producing as it does a rotatory movement in a considerable portion of the upper part of the spine. I sometimes ask a man with alleged injury to the back to get up on his toes and come down heavily on his heels. If he does this and complains of no pain, an injury of any import may be put out of court.

Stiffness of the back is often proved to be non-existent by the following simple manœuvre: In the process of the examination, the patient is asked to drop his trousers and pants to his ankles. In the ordinary course, when a stiff back is complained of, this will be done with great deliberation and apparent pain. But when, after a thorough examination of the spinous processes, and some little time spent in other ways, the patient is told suddenly and with some cheerfulness that the examination is over, he will often, with evident relief, suddenly stoop down from the erect position with alacrity and pull up his trousers. I well remember on one occasion I dropped my pencil while examining such a case, when the stiff-backed one very courteously and nimbly picked it up and handed it to me—a circumstance which quite satisfied me, but not the jury who subsequently tried the case, for the so-called patient absolutely denied all recollection of the incident! A friend of mine says that he occasionally drops a coin in his consulting-room, in the hope that he may find his patient picking it up. I have never resorted to this device, for it is open to obvious disadvantages.

The *mala fides* of a patient may readily be exposed by the use of the electric battery. The method of application is as follows: One pole is gradually approached towards the seat of alleged pain; the battery is left in noisy action; but unknown to the patient the current is switched off as the pole approaches the alleged painful area. Yet the patient frequently complains of very severe pain, describing it as being like a knife going through him, although in fact there is no current for him to feel. An ignorant and determined malingerer assumes, because he hears the battery still in action, that the current must reach the seat of alleged pain. The value of this test depends upon it being applied exactly as described, and being repeated two or three times, so that there may be no possibility of error.

Pain in the back is often not physical but mental. On one occasion on investigating an alleged tender spot on the back of a woman who had had a slight accident some time previously, I suggested that if firm pressure with the palm of the hand was made over the alleged painful area and in its neighbourhood, she would not feel it painful; she at once agreed to this. Although on very firm pressure in this way she complained of no pain, yet when I took away my hand and pressed on the same spot with one finger, she made loud complaint.

Pain is often complained of as radiating in directions in which no nerves are found. Often a man will complain of severe pain anywhere on his back when this is even lightly touched, but if subsequently the examiner proceeds to examine his lungs at the back, he will allow very firm pressure on his back with the stethoscope without complaining.

The stethoscope may serve more than one purpose in the examination of a malingerer. Any experiment which results in clear proof that the examinee is not truthful is always of value when dealing with subjective symptoms. On one occasion a man complained of severe pains, alleged to be due to an accident, in the right side of his chest, when he took a long breath. I listened with the stethoscope and asked him to take a long breath, which he said hurt him very much. But when I removed my stethoscope to the left side of his chest, and indicated that I had done with the right side, he continued, when requested, to take long breaths, making no complaint whatever.

Giddiness being a subjective symptom, it is of course practically impossible dogmatically to deny or affirm the presence of this complaint. After examination one is often able to say in the witness-box that there is no physical evidence of it, and that one has merely the man's statement. The following test is useful: the patient is asked to put his heels and toes together, to touch his toes with his hands, then suddenly assume an erect position, and then shut his eyes. If he does this repeatedly and always stands perfectly steady each time, this is of course not absolutely incompatible with alleged giddiness at another time, but it certainly goes a long way to prove that he is not giddy on the occasion of the medical examination.

Traumatic Neurasthenia and Functional Neuroses. One of the commonest allegations of injured persons is that they are suffering from traumatic neurasthenia. That such a condition exists and is a very definite disease I am thoroughly persuaded; but a large number of cases which are mostly fraudulent, allege traumatic neurasthenia, as no one who has seen anything of the law courts would dream of denying. Where traumatic neurasthenia ends and fraud begins is not a territory, but a very thin line. My experience is that highly neurotic plaintiffs are taught unconsciously to become introspective as the result of many medical examinations, much interviewing of their solicitors, many confabulations with friends who have met with the same or similar injuries, and consciously or unconsciously they feel pains and aches which, had they taken courage in both hands and returned to work, would have been either absent or ignored.

On the other hand, there is no doubt that traumatic neurasthenia frequently occurs, especially in association with an accident of a somewhat dramatic nature, to which much publicity is given; a marked impression is left on the mind, which acts and reacts in a way detrimental to the injured person's nervous stability. A large number of cases of this sort have been very successfully dealt with at my instigation by the simple process of isolating them from the bad environment of their sympathetic friends, removing them from consultations with their legal advisers, and putting them under the care of hospital physicians well trained in the diagnosis and treatment of functional nerve disease, combined with firm but kindly nursing, abundance of good food, and suitable occupation. The massage and electric baths which accompany the above have also a remedial effect, probably also mental effects. But the main factor in my experience is the isolation from a vicious environment, and the deliberate attack which is made upon their morbid mentality.

Malingering in Skin Disease is not very difficult to detect. The lesion as a rule has an unusual distribution. It is often found in situations which are easily reached by the right hand, but seldom on the mouth, nose, ear, scalp, palms of the hands, or soles of the feet. The marks often run longitudinally (straight lines are unknown in dermatology); the ulcers are often perfectly circular. The surrounding skin is significantly healthy. With regard to alleged sensation, either the patient complains of excessive pain on light touch, or he says he has no feeling at all. Lesions have a wonderful proclivity for appearing where they are expected, and if in the hearing of such a patient, a fresh ulcer in a certain place is predicted, the prophecy is often fulfilled on or about the time mentioned. One of the best methods of detecting self-inflicted lesions simulating skin disease is to put on an occlusive dressing of plaster-of-Paris. Much assistance can often be got from smelling the eruption, and litmus paper often reveals an acid, which arouses suspicion. In doubtful cases, diagnosis will often be assisted by the discovery of a pear shaped mark below the edge of the ulcer, which is lighter in colour and shows a less intense inflammation than the primary lesion. The flattened, sliding epithelium of a large blister in which there are no pemphigus-like blebs, is suspicious. It is well to remember that all skin lesions, whether genuine or artificial, are often masked by a secondary dermatitis, the result of pathogenic organisms aided by scratching. The character of a lesion depends not only on the means employed to produce it, but the method. Some solutions of carbolic acid irritate; a pure solution is anæsthetic; the one will produce a dermatitis and the other may often lead to gangrene.

Malingering in Hernia.—The late Mr. Barnard stated that there was more attempted fraud from alleged hernia than from any other part of the body. Most medical men recognize that the origin of hernia is a congenital patent funicular process, and that the hernia is brought about by the gradual opening up of this pre-existing closed pouch. It is perfectly obvious that the peritoneum cannot suddenly stretch to form a pouch; anyone who doubts this statement can convince himself of its truth by making the attempt at the next post-mortem examination which he conducts. The pressure to produce a hernial sac must be gradual. The intermittent pressure produced by running, sneezing, coughing, etc., and the ordinary straining and pulling and pushing of the working man, sometimes distends the pre-existing sac, and allow a small portion of the bowel gradually to find its way through. Occasionally the diagnosis of a recent or old rupture is somewhat difficult to make, short of actually seeing the tissues, but it is obvious that a large hernia which reaches to the bottom of the scrotum, admittedly painless, which can be replaced with the greatest possible ease, and is accompanied by a large, rounded, thickened inguinal ring is a rupture of many years' standing. It is my practice in difficult cases to be present, if possible, at the operation for radical cure which very properly follows the discovery of a rupture, and the brawny hard mass of omentum, with many swollen veins, and adherent to the sac, tells its own tale.

Conduct of the Medical Witness in Court.—The best preparation for successful evidence in the law court is a thorough examination of the patient. When giving evidence never guess. Do not say that a limb is smaller than its fellow of the other side; state definitely what difference in inches there is in the circumference. Before going to court always refresh your memory by re-reading your notes taken from reports given at the time of the examination, and if the subject is in the least obscure, refer diligently to standard works and authorities, in order that, if questioned generally on your knowledge of the subject, your evidence may be both accurate and of value. Reference to authorities has also the obvious advantage that isolated sentences may be taken from these authorities and quoted against you, and familiarity with the context is the best preparation for such a contingency. Quite recently in an important trial I was able to point out to the opposite side that at a former sitting, before I had been brought into the case, Taylor's "Medical Jurisprudence" had been quoted, and a certain statement made, which a later edition (which I took with me to court) controverted.

When asked a question give a definite answer. Expert witnesses are entitled to give an explanation, but they must first answer the question. For instance, if asked in a law court, "Did you prick the patient with a pin over an alleged painful area?" the answer is

"Yes, this was done in the ordinary course of discovering the sensitiveness or otherwise of the alleged painful area." Never use technical language. Remember that you are sworn not only to tell the truth, but the *whole* truth, which presumably refers to *suppressio veri*.

Reference.—[1] "Malingering." (Arnold, London.)

MALTA FEVER.

Leonard Rogers, M.D., F.R.C.P.

J. Courmont, P. Savy, and P. Mazel[1] record in detail a case of Malta fever occurring in the Lyonnais region of France. The pyrexia lasted eleven months, and was complicated by ulceration of the pharynx, epistaxis, congestion of the right lung, albuminuria, and hæmaturia, as well as diarrhœa. P. D. Stachan[2] discusses the frequency of the occurrence of hæmorrhage from the bowel in Malta fever, which, although very rare, has now been recorded several times.

References.—[1] *Rev. de Med.* 1912, 998; [2] *S. Afr. Med. Rec.* 1912, 304.

MASTOID DISEASE. (*See* Otitis Media.)

MEASLES.

E. W. Goodall, M.D.

D. I. Connolly[1] has published the results of 160 cases of measles treated in the following manner in the Manchester Workhouse Hospital: "As soon as the child is received into the special ward assigned to measles, a hot bath is given. Then follows a thorough application of **Eucalyptus Oil** to the whole body, with the exception of the hands and the part of the face about the nose, mouth, and eyes. The mouth is irrigated twice daily with weak **Alum Lotion**, and **Glycerin** and **Borax** is applied to the interior of the mouth and gums. The throat (tonsils and fauces) is treated with **Carbolic Oil** (1–10), morning and evening, in a similar manner to that described by Dr. Milne. [A firm mop of cotton-wool on the end of a pair of forceps is thoroughly soaked in the oil, and with it the tonsils and pharynx are swabbed as far up and down as possible]. Every day for the following four days the child is blanket-bathed morning and evening, and again rubbed all over with eucalyptus oil, the throat and mouth having the same treatment as on admission."

The patients were children drawn from the poorest classes of the community, and were most of them very young, of the ages at which measles is most common. The results were good; there were only 8 deaths, a fatality of 5 per cent. The rate in 100 cases during the previous year was 11 per cent. But the complication rate was high, 68 per cent; in only 18 per cent, however, did the complications develop after admission. The highest complication rates were those for the eyes (18 per cent) and the mouth, 13 per cent. [I am inclined to attribute this success to the very thorough treatment of the mouth and fauces, which is highly important; and would hesitate to draw conclusions as to treatment in measles from so few cases in consecutive years. It is a disease which varies widely in intensity within narrow limits of time.—E. W. G.]

Reference.—[1] *Pract.* 1912, ii, 664.

MECKEL'S DIVERTICULUM. (See INTESTINAL SURGERY.)

MEDIASTINAL TUMOURS.

J. J. Perkins, M.B., F.R.C.P.

Lloyd Roberts[1] discusses the early signs of mediastinal pressure, writing from an experience of 36 cases seen during recent years. The prognosis and results of treatment in this condition are not uniformly gloomy, as we are apt to think. Of his 36 cases, 22, it is true, suffered from malignant disease of the lung, glands, or œsophagus, and 2 others died later from lymphadenoma, but the remaining 12 included examples of tuberculous glands, mediastinitis, and syphilitic affections. No fewer than 11 recovered more or less completely from their symptoms. It follows from this that the possibility of syphilis should be borne in mind and **Antisyphilitic Remedies** vigorously tried, even without a positive Wassermann reaction. For the tuberculous cases general hygienic measures should be adopted and the use of tuberculin considered.

The paper is largely taken up with a most interesting discussion on the early diagnosis of mediastinal pressure, which is considered under the heads of (1) Obstruction to the venous circulation, (2) Obstruction in the respiratory tract, (3) Referred pains, and (4) Effect upon the pericardium. Under the heading of *venous obstruction*, the dilated veins seen on the surface of the thorax and abdomen, together with associated œdema, being familiar to all, the writer calls especial attention to the symptoms of pressure on one particular vein which is very apt to be overlooked, the vena azygos major. His attention was first drawn to the effects of pressure on this vein by a case of general anasarca known to be due to mediastinal pressure because the heart and urine were absolutely healthy. The pressure implicated the superior vena cava and the right auricle, but there was one symptom which hardly fell into line, namely, that the effusion into the peritoneal cavity was quite insignificant in comparison with the œdema of the abdominal wall and lumbar region. These parts being drained into the azygos vein suggested that pressure on its course might be the cause of the peculiarity. The post-mortem examination showed that this was the case, and the writer was able to verify the value of the symptom in subsequent cases. Occasionally the œdema met with in obstruction of the vena cava may be quite brawny, with almost complete absence of pitting. Some brilliant examples of the complete disappearance of the condition under specific treatment are given.

Under the heading of *respiratory pressure* attention is called to the association of three physical signs as almost distinctive, viz., normal resonance, diminished or absent breath sounds, diminished or absent tactile fremitus. Such cases, of course, are often mistaken, as the writer points out, for phthisis or pleural effusion, an error which would be avoided by a careful attention to this triad of physical signs. Among the other symptoms he calls attention to the inequality of the pupils often present, and to the various forms of pain which may for a long time have been the chief if not the only complaint, and which should lead to careful examination of the chest. The writer considers pericarditis as almost diagnostic of malignant growth in the aged, as it is of rheumatism in the young or of Bright's disease in middle life. The importance of examining for enlarged supraclavicular glands is emphasized; the diagnosis, once suspected, can be confirmed in most instances by *x*-ray examination.

REFERENCE.—[1]*Lancet* 1912, ii, 1714.

MELÆNA NEONATORUM. (*See* HÆMORRHAGES IN THE NEWLY-BORN.)

MENINGITIS, OTITIC. (*See* OTITIS MEDIA.)

MENINGITIS, TUBERCULOUS.

Purves Stewart, M.D., F.R.C.P.

In a series of forty-one cases of tuberculous meningitis (of which thirty-eight were verified by autopsy, and the three remaining cases had tubercle bacilli in the cerebrospinal fluid), Garrod and Frew[1] found *glycosuria* to be present in no less than fifteen, i.e., nearly 37 per cent. In every case daily examinations of the urine were made from the date when the diagnosis of tuberculous meningitis was first established. Glycosuria was found to be a terminal symptom, occurring as a rule during the last two days of life. Only in one case did it appear four days, and in one other case three days before death. Once established, it persisted for the remaining days of the patient's life. Other forms of meningitis (post-basal, meningococcal, pneumococcal, influenzal, etc.) showed no glycosuria, even though the clinical symptoms were as severe as in the tuberculous cases. The cause of the glycosuria is at present obscure.

REFERENCE.—[1]*Lancet*, 1913, i, 15.

MENSTRUAL DISORDERS.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

Artificial Menopause.—**Ovarian Grafting.**—Davidson[1] describes three cases in each of which thin slices of the patient's ovary were grafted into the rectus muscle. He chose this site for two reasons; if anything went wrong, it would be easy to get at the grafts without opening the abdominal cavity, while if the graft took, swelling and tenderness at the period could be easily identified. In one case it did not take, and the menopause followed the operation. In two cases it took; the patients had periodic discharges of blood from the uterus, and the graft became swollen and tender. Davidson claims that his patients, who suffered from severe pelvic pain before operation, completely lost it afterwards.

Whitehouse[2] describes a case of ovarian grafting. He cut the healthy ovarian tissue into small pieces and scattered them in the subperitoneal connective tissue and in the rectus muscle. Menstruation came on after the operation, and has continued; there are no symptoms of the menopause, and no pain in the abdominal wall when the period occurs. He considers that minute grafts in a very vascular bed (muscle is satisfactory for the purpose) give the best results; and that the ovarian tissue should be left in the body fluids within the peritoneal cavity until it is ready for grafts. Absolute asepsis and avoidance of strong antiseptics, which would damage the tissues, are very important.

Hill[3] writes a note on the use of **Desiccated Corpora Lutea**, stating that he has seen consistently good results following its administration for the symptoms of artificial menopause. An enquiry into the cases of failure shows that the duration of the treatment was too short. He gives 5 gr. three times a day, half an hour before meals; the treatment is continued for at least one month and often for two, amounting to 100 to 200 capsules.

Dysmenorrhœal Membranes.—Blair Bell[4] believes that there are only two forms of uterine casts passed during menstruation, blood casts and endometrial casts. The former are merely retained clots formed of menstrual blood, which normally does not coagulate. The clotting he considers is due to an unhealthy condition of the endometrium, or to very rapid flow of blood. The passage of these clots gives rise to dysmenorrhœa. Endometrial casts are not common, and when thick are very difficult to distinguish from abortions. Sections show a decidual-like change in the stroma cells of the endometrium. Though many people think these casts are early abortions, the specimens described by Blair Bell were obtained from a woman who two years previously had had both tubes and ovaries removed.

REFERENCES.—[1]*Edin. Med. Jour.* 1912, ii, 441; [2]*Clin. Jour.* 1913, May, 107; [3]*Surg. Gyn. and Obst.* 1913, i, 712; [4]*Ibid.* 651.

MENTAL DISEASES.

Bedford Pierce, M.D., F.R.C.P.

ETIOLOGY.—The problems which surround the etiology of mental disorder continue to be attacked from several standpoints. Two schools of thought flourish. They were forcibly illustrated by the proceedings of the International Congress of Medicine on two successive days. One was devoted to the consideration of the toxic insanities, the next to psycho-analysis. At the former a distinguished author enunciated the dictum, "All insanity is either toxic or traumatic," and there was no reason to think he included under the latter term what is frequently spoken of as psychical trauma. According to this school the content of the mental disturbance is of small account, and little importance is attached to psychical factors of causation, such as the effect of mental stress or of shock or terror, except in so far as these may produce alterations in the bodily secretions or disturb metabolism. The other school of thought is chiefly concerned with the past mental history, the internal conflicts and struggles, the previous experiences, the effect of repression and restraint; and in these they find not only an explanation of the symptoms present, but also a means of cure. This brief description is probably just to neither party, but it will suffice to indicate the differences of opinion that arise when etiological problems are considered.

In controversies of this kind it is not unusual to find that both parties are not far from the truth, and though at the present time no dogmatic statements can be made, it will be safe to say that insanity usually arises from the interplay of three factors: heredity, toxæmia, and mental stress. These rarely, if ever, act singly. We can hardly conceive of a toxic agent creating ideas, as the latter must depend upon the individual's previous experiences; on the other hand, the person's reaction to external influences depends largely upon inherited predisposition and on the state of his bodily health.

There is a steady growth of opinion that by psycho-analysis and other methods of psychical investigation it is possible to trace the development of morbid ideas and impulses. At the same time it is recognized that these mental symptoms may never have appeared but for the influence of some toxic agent acting on the nervous system.

The question of causation is discussed by Chambers[1] in his presidential address "On the Prevention of the Insanities," to the Medico-Psychological Association. He quotes Murri with approval: "Causation consists in the result of several individual factors co-operating in the production of one and the same effect." He proceeds: "But the complex of causative agencies which we have to recognize in the case of the insanities is one which, if the phrase be allowed, has extension in two dimensions. In the delirium of typhus fever the physical agencies are in formidable rank, but in certain insane conditions, which are hardly to be distinguished clinically from such delirium, we have to do battle with an enemy whose Indian file issues in dim perspective from the gloomy recesses of an unknown past. . . . Possibly with the advance of knowledge we may find that there will become more clearly discernible than at present some line of demarcation between the insanities that disappear when physical states are rectified, and those whose causation now appears to be more complex. . . . A new importance has been given to the unwinding of the causal claim, by the recognition of the unconscious memories of bygone days as determining forces in the psychoses of maturity. . . . Long ago, Oliver Wendell Holmes, in speaking of the 'rosy pudency of sensitive children,' taught us that 'the first instinctive movement of the little creatures is to make a *cache* and bury in it beliefs, doubts, dreams, hopes, and terrors!' . . . 'Everybody has had his childish fancies, but sometimes they are passionate impulses which anticipate all the tremulous emotions of a later period." In this connection he asks if the etiological relationship between some states of body and mind, as we see them, have ever been more neatly expressed than by the dreamer amongst the water-lilies of the Ouse when he wrote :—

'Faults in the life breed errors in the brain;
And these reciprocally, those again.'"

REFERENCE.—[1] *Jour. Ment. Sci.* 1913, Oct.

MESENTERY, SWELLINGS ARISING IN.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

Poulsen[1] reports a case of *chylous cysts* of the mesentery in a girl of seven who had suffered for six months from brief attacks of intestinal obstruction. Finally, there occurred an attack which was not relieved, as the previous ones had been, by aperients. Diagnosing appendicitis, the abdomen was opened, revealing multiple cysts in the mesentery, complicated by volvulus of a loop of small intestine, with perforation. Resection, with entero-anastomosis, was followed by recovery. Examination of the specimen showed three large and numerous small chylous cysts. Two of the larger cysts lay between the muscular and serous coats of the intestines (an unusual situation), while the remainder lay between the leaves of the mesentery.

Floderus[2] has collected 75 cases of *primary tuberculosis of mesenteric glands* from the literature, and reports 18 personal cases. Infection usually occurs from the intestinal tract, and it has been shown that the bacilli may infect the glands after passing through the intestinal wall without leaving any trace of its passage. The disease most frequently occurs in the first two decades of life. Among the initial symptoms, are abdominal pain, malaise, anorexia, loss of strength, and emaciation. The pain is usually localized in the umbilical or cæcal region; if severe, it may indicate the onset of obstruction or peritonitis, especially if accompanied by vomiting. Sometimes the presence of a palpable tumour will aid in the diagnosis, and the presence of calcified glands may sometimes be demonstrated with the x rays. The principal complications are tuberculous peritonitis from rupture of a suppurating gland, and obstruction, either from pressure of the tumour mass or from adhesion of intestine to the inflamed glands.

Treatment is at first medical. All possible sources of further infection should be eliminated from the food, and the patient should be placed in the best hygienic surroundings. If these measures fail, operation may be resorted to. Simple exploratory laparotomy is said to give as good results as in tuberculous peritonitis, but the number of reported cases is too meagre to draw any definite conclusions. Enucleation of the enlarged glands is usually practised, and the results are good even when the removal is incomplete; Floderus has treated the glands thus in five cases, and resected a segment of intestine, without any mortality.

REFERENCES.—[1]Deut. J. Chir., cxx, 1913, 170; [2]Surg. Gyn. and Obst. 1914, i, 44.

MUMPS.

E. W. Goodall, M.D.

Feiling,[1] from a study of sixty consecutive cases, found that the blood in mumps shows definite changes in the corpuscular content, a slight increase in the total number of leucocytes, and a lymphocytosis which is both relative and absolute. This lymphocytosis is present on the first day of the disease, and persists for at least fourteen days. The occurrence of orchitis does not invariably alter the blood picture, which is of distinct diagnostic value in differentiating mumps from other inflammatory swellings of the parotid or submaxillary salivary glands, and from cases of lymphadenitis.

He also records the results of the examination of the *cerebrospinal fluid* in a case of mumps followed by symptoms of acute meningitis, and refers to other published cases of a like nature. He concludes that a lymphocytosis of the cerebrospinal fluid occurs in mumps, when that disease is complicated by meningitis or by lesions affecting the cranial nerves ; and that it has also been found in cases of mumps which have presented no clear clinical symptoms of any organic lesion of the nervous system. He thinks that the virus of mumps excites an inflammatory reaction in the body whose characteristic feature is a great aggregation of lymphocytes.

Two cases of *acute enlargement of the ovary*, seemingly due to inflammation, immediately following an attack of mumps, have been recorded by Harlow Brooks.[2] Both patients were young adults ; in one the mammæ were also affected, and appeared to undergo atrophy. This complication of mumps is rare ; at any rate very few cases have been recorded.

REFERENCES.—[1] *Lancet*, 1913, ii, 71 ; [2] *Jour. Amer. Med. Assoc.* 1913, i, 350.

MYCETOMA. *Leonard Rogers, M.D., F.R.C.P.*

R. L. Sutton[1] reports on the occurrence of mycetoma in America, and records two cases in detail. He agrees with other recent workers in regarding the parasite as a streptothrix. The only treatment is **Amputation.** In one patient who refused operation, only slight improvement resulted from **Potassium Iodide** and **Copper Sulphate** (0·02 mgram) internally and **Iodine** locally.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1913, ii, 1339.

MYCOSIS FUNGOIDES. *E. Graham Little, M.D., F.R.C.P.*

Howard Fox[1] reports a well authenticated case of psoriasis of twenty-five years standing, succeeded by the development of equally well-authenticated mycosis fungoides, without the prodromal stage in which intense itching is so common a feature. These premycotic eruptions have often been mistaken for psoriasis, but instances in which the actual diagnosis of that disease has been made by experienced dermatologists are very uncommon ; the author can only find two such besides his own. [*See also* SKIN, GENERAL THERAPEUTICS OF.]

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* 1913, ii, 330.

MYOSITIS, ISCHÆMIC. *Purves Stewart, M.D., F.R.C.P.*

This variety of deformity is much commoner than the somewhat scanty references to it in the ordinary text-books would lead us to suppose. Originally described by v. Volkmann more than twenty years ago, it is a syndrome confined almost exclusively to the upper extremity. It occurs chiefly in children and adolescents, and is due, in every case, to constriction of the limb by a splint or bandage which has been too tightly applied. An incomplete ischæmia is thereby produced (complete ischæmia would cause gangrene), and the subjacent muscles undergo coagulation of their contractile substance. This is followed by acute myositis and, finally, by fibrous transformation of the muscles, with permanent shortening and deformity. The muscles affected are those on the flexor aspect of the forearm; the extensor group remains unaffected. The fibrous sclerosis of the affected muscles is patchy and irregular, varying in degree in different cases. Thus above and below the bands of sclerosis there may be areas of normal muscle fibres (see *Fig.* 40) giving to the muscles, as pointed out by Binet,[1] a digastric or trigastric character. This muscular affection comes on rapidly, in the course of a few days, following the application of the splint or bandage.

The premonitory symptoms supervene within a few hours, and it is important to recognize them, since by promptly relieving the constriction, the serious and permanent signs of the fully-developed syndrome can be avoided. These premonitory symptoms consist of pain in the limb (sometimes absent), swelling of the hand, and cyanosis of the fingers.

Once the malady is established, its signs are permanent. There is a special deformity of the hand, which, owing to shortening of the flexor muscles, is flexed at the wrist and at the interphalangeal joints, whilst the metacarpo-phalangeal joints remain extended. This flexion of the fingers varies in intensity in different cases, and may attain to an extreme degree. Not infrequently the thumb escapes (having its own long flexor), whilst the four other digits are severely affected. If the wrist be passively flexed still further, the flexor muscles are slackened, and the fingers can then be slightly extended. On the other hand, attempted extension of the wrist exaggerates the deformity of the fingers. The patient himself is unable to extend the fingers voluntarily. The electrical reactions in the surviving fibres of the contracted muscles remain normal.

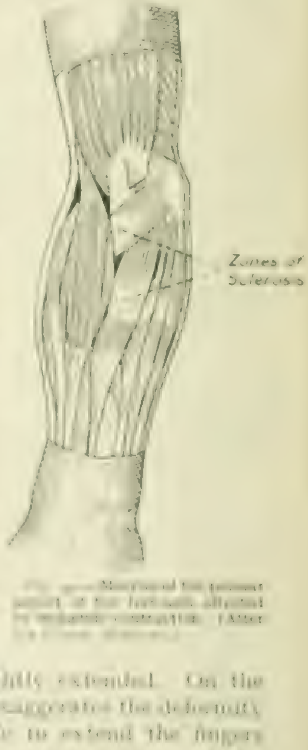


Fig. 40.—Muscles of the anterior aspect of the forearm affected by ischæmic contracture. (After La Presse Médicale.)

TREATMENT.—Once the affection is established, passive stretching of the muscles is valueless, as also are massage or other manipulations. The only satisfactory remedy is to lengthen the flexor tendons by a somewhat difficult plastic operation or, more simply, to excise a portion from the shafts of the radius and ulna, enough to allow of the fingers being placed in a position of extension or even of slight hyper-extension. The patient then has a shortened forearm, but it ends in a useful hand.

REFERENCE.—[1] *La Presse Méd.* 1912, 312.

NASAL ACCESSORY SINUSES.

W. G. Porter, M.B., F.R.C.S.

For the treatment of chronic suppurative ethmoiditis, Hajek[1] advocates **Intranasal Operation** under good local anæsthesia (cocaine with adrenalin) and the removal of as much as possible at one sitting, a *sine quâ non* being absolute orientation during the whole operation. If necessary, local obstacles, such as a deviated septum, must previously be corrected. Repeated sittings may be necessary before the whole of the disease is removed, but sufficient time must be allowed between them to allow all reaction to pass off. Packing should be avoided if possible, during the after-treatment. **Extranasal Operation** is indicated when the intranasal method has proved insufficient, when the frontal sinus is markedly affected and requires operation, or when orbital abscess is present or threatened. Lambert Lack, in continuing the discussion, deprecated the piecemeal operation, and advocated his intranasal operation, which is carried out in one sitting, under general anæsthesia, guided by the sense of touch. He has had one death in 300 cases, and knows of six deaths and two cases of blindness under other operators. [This is a somewhat formidable list of fatalities when it is remembered that the slower methods, or, failing them, an external operation, are not attended with risk to life.—W. G. P.] He limits the operation to patients under 50 years of age; and when there is frontal sinus suppuration or orbital complication, he prefers an external operation.

Double Sphenoidal Sinus Suppuration.—Watson Williams[2] recommends the removal of the posterior half inch of the upper part of the bony septum nasi corresponding with the sphenoidal sinus septum. This gives a very free opening into the sinuses, and does not tend to close, as is frequently the case when the anterior wall alone is removed.

Dan McKenzie[3] gives a systematic account of *diffuse osteomyelitis from nasal sinus suppuration*, the association of which with sinusitis was first detected by Tilley. His remarks are based upon the records of 48 cases. Diffuse osteomyelitis of the cranial bones may be compared with chronic diffuse osteomyelitis of the long bones, but differs in that it is referable in the vast majority of cases to some continuous infective focus. Of the 48 cases, 45 originated in the frontal sinus and 3 in the antrum. There is an absence of records of osteomyelitis arising from the sphenoidal sinuses or ethmoidal labyrinth. There is therefore no doubt that frontal sinus suppuration leads more frequently to this condition than maxillary disease.

As regards the *process of infection*, nothing is known definitely: whether it takes place by direct invasion of the bone spaces or by the efferent veins: the author inclines to the former view. Some other factor must, however, also be present, or osteomyelitis would be much more frequent; and possibly, as Shilling suggests, it is because the diploë as a rule abuts upon the walls of the sinus at one place only, namely, at the upper recess. McKenzie, however, believes too much stress should not be laid on the anatomic structure of the bone. Once the bone is affected, the condition tends to spread without limit, and may involve the whole cranial vault; this is generally attributed to thrombophlebitis of the diploic veins. The affection of the bone is a purulent rarefying osteitis leading to destruction of all its constituent elements. The pus which originates in the diploe at a later stage forms abscesses between the bone and pericranium and the bone and dura. At a still further stage, areas of bone become necrosed and are exfoliated as sequestra. In favourable cases the gaps are filled up later by the formation of new bone. Metastases to distant parts of the body are rather rare, and were recorded in only 5 cases. Of local extensions, leptomeningitis occurred in 15 cases, brain-abscess in 10, thrombophlebitis (intracranial) in 9, and subdural abscess in 3.

As regards age incidence, the spontaneous cases preponderate in the second and the post-operative in the third decade of life. Cases of osteomyelitis may be divided into spontaneous and post-operative. Out of 41 of the author's collection, 20 belonged to the former and 21 to the latter category. In regard to the latter, in several instances the disease did not appear until some weeks after operation. Of the spontaneous cases, 7 recovered after appropriate treatment, while not one of the post-operative recovered. What factor in the operation it is that leads to osteomyelitis is not known, though possibly curetting the walls of the sinus, inadequate drainage, and injudicious bruising of the bone edges by forceps will predispose to its occurrence. The exciting cause in spontaneous osteomyelitis is equally unknown, though the disease is more common in acute than in chronic sinusitis.

The author divides these cases into the acute, lasting three to twelve weeks; and the chronic, with a duration of six months to two years. In the former, pyrexia is continuous and the progress of the disease uninterrupted. In the chronic type the progress of the disease is broken, and in the periods of intermission may appear cured. In spontaneous osteomyelitis the disease may be unsuspected until the sinus is opened; but the appearance of an oedematous swelling at some distance from the sinus is suspicious, and there is usually a rise of temperature above its previous readings. In post-operative cases the onset is even more insidious; the wound may have healed and the temperature be normal when a superficial swelling appears which slowly extends and does not improve on being opened, and the discharge of pus becomes plentiful. Pyrexia, headache, and symptoms of toxæmia appear, and sooner or later an oedematous swelling of the soft parts develops beyond the confines of the sinus. The opening of abscesses as they form, and the removal of necrosed bone, cause temporary checks to the disease, but recurrence takes place, and nearly always death finally results from toxæmia, pyæmia, asthenia, or some intracranial complication.

DIAGNOSIS.—This rests on the appearance of an oedematous swelling of the bone beyond the affected sinus, but syphilitic disease of the frontal bone may be mistaken for osteomyelitis.

The author points out that the recognition of the risk of post-operative osteomyelitis has completely revised the indications for operation on the frontal sinus, which nowadays is rarely undertaken solely because there is a purulent discharge from the cavity. If operation is performed, many writers postpone suture of the external wound, and further curetting of the cavity should be avoided. Once osteomyelitis has set in, the only chance of saving the patient lies in the immediate and entire removal of the diseased bone. If recovery takes place, the defect will be made good by osseous regeneration.

REFERENCES.—[1] *Brit. Med. Jour.* 1912, ii, 1130; [2] *Jour. of Laryngol.* 1912, 591; [3] *Ibid.* 1913, 6, 79, and 129.

NECK, CYSTIC HYGROMA OF.

Priestley Leech, M.D., F.R.C.S.

Dowd[1] reports three cases, and probably four, of cystic hygroma; he gives a summary of the other recorded examples, 91 located in the neck, and 35 situated principally in the axilla, but in part at least extending thither from the neck. The term should be restricted to cysts lined with endothelium, and having a marked power of growth. The most satisfactory explanation of their existence is that embryonic sequestrations of lymphatic tissue existed, and that they had the power of persistent irregular growth.

Excision is the best treatment; if this is impracticable, partial removal is the next best.

REFERENCE.—[1] *Ann. Surg.* 1913, i, 112.

NEPHRITIS.

Francis D. Boyd, M.D.

High Arterial Tension.—(*See also* BLOOD-PRESSURE.)—Janeway[1] reviews in detail our present knowledge of the problems of nephritic hypertension from both clinical and experimental standpoints.

In nephritis, the cause of the high blood-pressure and that of the cardiac hypertrophy must not be identified absolutely, though, in the main, the hypertrophied heart may be looked upon as the result of persistent high blood-pressure. The purely mechanical theory, which ascribes the high blood-pressure to increased resistance in the kidney, must be abandoned. A theory which is partly mechanical is based on the claim that anatomical study shows a parallelism between the extent of the glomerular changes and the hypertension. Such a hypertension might be considered as compensatory, and of the nature of a regulatory mechanism to ensure sufficient circulation through a kidney showing extensive capillary obliteration. This theory, however, cannot be accepted on anatomical grounds, as cases where marked cardiac hypertrophy exists may show little glomerular change; and amyloid disease, which is *par excellence* a disease of the glomeruli in its pure form, seldom if ever increases blood-pressure or causes hypertrophy.

Much experimental work has been done on dogs by reducing the amount of functionating kidney, and observing the effect on urinary secretion and blood-pressure. In reviewing the subject, Pässler concludes: (1) That the hypertrophied heart in nephritis is the result of kidney disease; (2) That as a result of the renal lesion there probably occurs an increased irritability of the vasoconstrictor apparatus, resulting in arterial spasm and an increased resistance in the systemic circulation, with hypertrophy of the left ventricle; (3) That the hypertrophy of the left auricle and the right heart in nephritis, is a later consequence of insufficiency of the left ventricle. This he argues, not only from the finding of pure left ventricular hypertrophy in his experiments, but from a critical review of the clinical evidence. Janeway carried out a number of experiments which confirmed the views of Pässler.

Many attempts have been made to discover *chemical* substances exerting a pressor effect. Renin may be dismissed both on clinical and experimental grounds. The development of the "adrenalinæmia" theory of hypertension is a fascinating chapter in the history of speculative medicine. Suprarenal lesions have been described by many observers, but it seems probable that the changes found in the gland are the result of local arteriosclerosis of its own vessels rather than the *cause*. The experimental lesions produced by *epinephrin* are quite unlike human arteriosclerosis. Janeway and Park, as the result of a long series of experiments made by a modified Meyer method, concluded that the vasoconstrictor substance of defibrinated blood is not epinephrin, and that the substance acted on the smooth muscle directly without relation to its sympathetic innervation. Neither with normal blood nor with the blood of hypertensive patients could any definite trace of epinephrin effect be obtained. The problem has been approached by the investigation of blood-sugar. It is well known that the injection of epinephrin into an animal whose liver contains glycogen, results in an increase of sugar in the blood which, if it reaches a sufficiently high percentage, induces transient glycosuria. It has therefore been reasoned that if hypertension is associated with increased circulating epinephrin, hyperglycæmia should be present. The results obtained so far have been conflicting. Janeway's observations are highly suggestive of the presence of epinephrin in the blood of a patient with high pressure and hyperglycæmia, but are too variable to permit the conclusion that the substance has been identified. Experimental medicine has not then solved the riddle of hypertension, nor can clinical medicine make the claim.

Janeway gives an analysis of the histories of 350 private patients whose blood-pressures registered over 165 mm. Hg. The patients fall into two groups: (1) made up of individuals well past middle life. The clinical picture is usually that of some degree of cardiac insufficiency, and their death is cardiac. Arteriosclerosis is a commonly associated lesion; anginal attacks are fairly frequent. About 10 per cent are elderly diabetics. While the bulk of them at some period show albumin, casts, and other urinary changes usually interpreted as indicating nephritis, and while at autopsy the majority prove to have either arteriosclerotic atrophy of the kidney or the so-called "primary contracted kidney," it must be borne in mind that during life many of these individuals fail to show any urinary changes other than those of chronic passive congestion. There are also a number of autopsy cases in which the clinical picture of permanent high blood pressure has been associated with kidneys found to be normal or with mere secondary congestion due to failing heart. In the main, the treatment of these individuals lies in safeguarding the heart. From the clinical standpoint they may be described as cases of hypertensive cardiovascular disease. A closely related group shows predominant cerebral symptoms —headache, vertigo, apoplectic attacks. Polyuria is found more frequently in this group, and there are evidences of severe functional damage to the kidneys. We should recognize clearly that the differentiation of the various anatomical types of nephritis is altogether beyond the powers of clinical diagnosis. The clinician is concerned with structural changes only so far as they give rise to disturbances of function, and can be utilized for diagnosis or prognosis. When hypertensive cardiovascular disease exists, and investigation of the kidney function shows no change of importance, it is immaterial what may be the exact appearance of the kidney; the patient must be treated from the standpoint of the circulatory disorder. Pathologists are returning to the fundamental idea that the real disease at the back of what we call chronic interstitial nephritis, is a disease of the small blood-vessels, and that the lesion of the kidneys is a secondary manifestation. Hypertensive cardiovascular disease is recognized clinically as a widespread disease of the arterioles in the various internal organs. The disease in its fully developed form involves the kidney, producing the small red granular or primary contracted kidney; but occasionally leaves it untouched.

Arteriosclerosis of the larger vessels may spread peripherally, but it constantly leads to high blood-pressure and hypertrophied heart. Patchy arteriosclerotic atrophy of the kidney is present, rather than the more diffused changes of arteriolar disease. Clinically, it is more commonly connected with insufficiency of the heart.

The symptoms of hypertensive renal disease may arise in three ways: (1) From purely quantitative reduction of kidney substance below the factors of safety; (2) In connection with the unknown intoxication which causes disturbances of the central nervous system, and which we call uræmia; or (3) In primary irritability of the vasoconstricting mechanism from unknown, probably extrarenal, causes, which lead eventually to arteriosclerosis. In the latter type, the disease of the kidney is the sequel, not the cause, of the generalized vascular lesion. No one can yet say what are the vascular poisons responsible for these types of hypertensive disease. Epinephrin may be one of them—that it is the only one seems improbable; the same applies to the secretion of the hypophysis. The first and second types of hypertension may, at any time, be superimposed upon the third; while the second, the uræmic type, must be considered dangerous in itself. Hypertension in the arteriosclerotic kidney is best regarded as a compensatory effort of the organism, to be interfered with only when danger threatens either through cardiac failure or through cerebral hæmorrhage.

Protein-free Diet.—The elimination of end-products of protein metabolism constitutes a large proportion of the total work the kidney has to perform. If the kidney power is insufficient, waste materials accumulate in the blood; the kidney is stimulated to further efforts, and its decreasing power is shown by gradual increase in the quantity of urine, a fall of specific gravity, and a rise in the blood-pressure. Goodall[2] points out that it is sought to save the kidney by diminishing the intaking of nitrogenous foods; but in practice it is thought unsafe to restrict protein intake below 50 to 60 grams, a quantity sufficient to keep up nitrogenous balance. There is evidence, however, that the sudden withdrawal of protein from the food causes no particular disturbance. Healthy individuals can be kept on a starch and cream diet, yielding only about 1 gram of urinary nitrogen and 3000 C. of energy, for periods of seven to ten days, without injurious effects.

Goodall relates an experience of the use of periods of low protein diet in six cases of chronic interstitial nephritis which were all in a fairly advanced stage, showing cardiovascular changes. In one case a starch and cream diet was used, but owing to its monotony was abandoned, and a diet instituted consisting of *sweets*, such as candy, honey, sugar, marmalade; *fruits*, as apricots, apples, bananas, blackberries, grapes, lemons, melons, oranges, peaches, pears, prunes, raspberries, strawberries; *vegetables*, such as asparagus, beans, oats, cabbage, carrot, cauliflower, celery, cucumber, lettuce, onions, potatoes, rhubarb, turnips, spinach, tomatoes, Brussels sprouts, rice; *starches*, such as tapioca, arrowroot; *fats*, as butter, olive oil, cream; *relishes*, as olives, vinegar, lemon juice, cucumber, and pickles. No difficulty was experienced in maintaining the caloric requirements of the body. With these foods the quantity of nitrogen excreted in the urine is the same as with the starch-cream diet. At the end of a period of five days, amounts of protein not exceeding 60 grams were added. These additions were made on the basis that 60 grams protein are contained in eight ounces of fresh beef, twelve ounces of fresh fish, two quarts of milk, nine eggs, twenty-one ounces of bread, and thirteen ounces of oatmeal (uncooked). Charts of the observations are given showing the blood-pressure, amount of urine, and urinary nitrogen excreted. In every case relief of symptoms followed the nitrogen-free period. In every case there was a distinct fall in the blood-pressure. In every case but one the sudden fall in blood-pressure was followed by a temporary rise on the fifth or sixth day. In all but one, the quantity of urine fell to normal. In all but one, the area of cardiac dullness decreased. It is obvious, then, that a protein-free diet can be maintained for a period of five to ten days without harm to the individual. With such a restriction, the accumulated end-products in the blood are promptly eliminated. The nitrogen contained in the blood falls to normal, and the kidneys and heart are given an opportunity to rest. Such a restriction may be followed by a low protein diet for a considerable period of time, even in advanced cases, without return of the disagreeable symptoms. The protein-free diet may be employed at intervals of not less than six or eight weeks.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* 1913, i, 625; [2]*Bost. Med. and Surg. Jour.* 1913, i, 750.

NEURALGIA, TRIGEMINAL.

Purves Stewart, M.D., F.R.C.P.

The treatment of trigeminal neuralgia by means of **Alcoholic Injections** into the foramina of exit of the branches of the nerve from the skull has now become securely established in practice. In the MEDICAL ANNUAL of 1909 and 1910 I described the technique of injections into the sphenoidal fissure, the foramen rotundum, and the foramen ovale. Those of us who have practised deep alcohol injections, have now and then observed cases in which the alcohol reached not merely the nerve-trunk at its exit from the skull, but also the Gasserian ganglion itself, as evidenced by complete anaesthesia of the whole trigeminal distribution, and even by the occurrence of herpes near the angle of the mouth, as in several cases of my own. When the ganglion with its nerve-cells is thus attacked, the effects of the alcohol injection are much more likely to be permanent than when we only destroy the infraganglionic nerve-fibres, which, in the course of time, tend to regenerate, and to conduct painful impulses once more. The ideal injection, therefore, is one which directly aims at injecting the Gasserian itself.

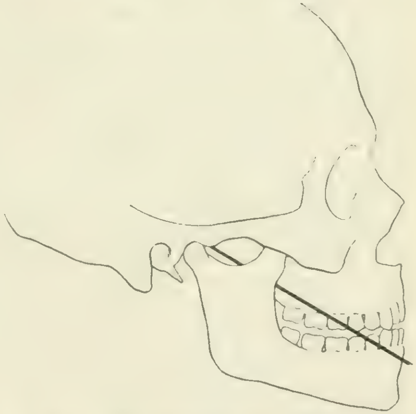


Fig. 41. Härtel's method of reaching the Gasserian ganglion, showing needle piercing the foramen ovale in the direction of the long axis of the latter.

In this connection a valuable paper by Härtel[1] has been published, wherein he discusses in detail the anatomical relations of the Gasserian ganglion, and describes a new method of reaching it through the foramen ovale (*Fig.* 41). Hitherto the usual path of approach to the foramen ovale has been transversely, along a line running between 2½ and 3 cm. in front of the osseous external auditory meatus, below the arch of the zygoma, the needle reaching the foramen ovale at a depth of about 4 cm. from the surface.

Härtel approaches the Gasserian ganglion along the long axis of the foramen ovale itself, i.e., from the front of the face, since the direction of the foramen is forwards, downwards, and outwards. It is important to enter the needle through the skin of the cheek without puncturing the buccal mucosa. In this way we avoid septic infection from the mouth. The foramen ovale varies in shape and size within certain limits, so that individual peculiarities have always to be reckoned with. It is a canal about 1 cm. long, rather than a foramen; and opens below on a smooth bony surface, along which the injection needle must approach. Posteriorly and internally from the orifice of the foramen ovale the bone is rough, irregular, and covered with cartilage and fibrous tissue. If, therefore, the point of the needle impinges on tissues of this sort, we know at once that its direction is wrong, and it must be withdrawn to an anterior and external plane. In approaching the foramen from before backwards, the needle must keep close to the outer side of the external pterygoid plate, care being taken never to get away from its hard smooth surface. The needle point then follows a curve convex outwards.

A successful puncture, reaching into the Gasserian ganglion, must avoid injuring certain important structures, such as the cavernous sinus, the internal carotid artery, the superior petrosal sinus, and the brain itself. Fortunately, if the needle be accurately in the long axis of the foramen ovale canal, it usually avoids these structures, provided that the point is not pushed upwards for a distance further than 1·5 mm. from the under surface of the temporal bone. Owing to slight variations in the direction along which the canal of foramen ovale runs downwards, the anterior end of the injection needle, i.e., the point of entrance close to the upper jaw, varies also. The average point of entry, according to Hartel, is the upper alveolar border of the second upper molar tooth. This he found to be accurate in 90 per cent of skulls. If we fail at this point, another spot is selected along the alveolar margin of the upper jaw, slightly behind or in front, all the punctures converging towards the lower opening of the foramen.

The *technique*, then, is as follows: The alveolar border of the second upper molar is identified, and the skin of the cheek pierced opposite this point. A finger within the mouth feels the needle through the mucous membrane (which must not be punctured), and guides it along the outer border of the upper jaw between the lower jaw (with masseter and temporal muscles) on the outer side, and the maxillary tubercle on the inner side, traversing the substance of the external pterygoid muscle. The depth of the foramen from the starting point at the second molar tooth is usually from 5 to 6 cm. This is conveniently marked by means of a small movable metal indicator sliding upon the needle, whose distance from the point is accurately measured before starting. This indicator can be felt in the substance of the cheek. The direction is further verified by pointing the needle (looking from the front) towards the pupil of the corresponding eye. It is convenient to check this by means of a second needle laid along the outside of the cheek. Looking at the face from the side, the needle point should be directed toward the articular tubercle of the zygoma. On reaching the foramen ovale, if we wish to inject the ganglion, we then pull back the metal indicator a further distance of 1·5 cm. along the stem of the needle, so that the point can penetrate the canal and reach the Gasserian ganglion itself; ·5 cm. of a 2 per cent solution of novocain, followed by a small quantity of alcohol, not more than 1 c.c., is then slowly injected, and the resulting anæsthesia carefully observed.

To reach the foramen rotundum and second division of the nerve, one set of landmarks given by Hartel is practically identical with those described by myself in the MEDICAL ANNUAL of 1910, viz.: The point of entry is immediately below the zygomatico maxillary suture, and the needle is pushed in along the surface of the maxillary tubercle upwards, backwards, and inwards for a distance of 4·5 to 5·5 cm., then the point is turned backwards till it touches the posterior wall of the pterygo-maxillary fossa, when it is pushed 1 cm. further to reach the mouth of the foramen rotundum. An alternative route is from the front, along the floor of the orbit itself. This is more easily accessible than the transverse route previously described. *The technique* is as follows: The point of entrance of the needle is at the lower border of the orbit, midway between its inferior-external angle and the zygomatico-maxillary suture. The globe of the eye is displaced upwards by the finger, and the needle is pushed along in the space between the finger and the floor of the orbit in a sagittal direction to a depth of 4 to 5 cm., perforating the pterygo-maxillary fissure, and impinging on the pterygoid process of the sphenoid. Seen from the side, the direction of the needle, when in the foramen, should just touch the upper edge of the auricular muscle. Seen from the front, it should point towards the upper and inner angle of the orbit. On reaching the foramen, the needle is pushed a few millimetres further, and the fluid injected, generally against some resistance, since the nerve completely fills the foramen. The needle must be kept along the floor of the orbit.

To reach the sphenoidal fissure (through which the branches of the first division emerge, together with the motor nerves of the eye), should this be considered advisable, it is best to approach it along the outer wall of the orbit, starting at its upper and outer angle, and passing along close to the bone for a distance of 3 cm.

After injection of the Gasserian ganglion, the whole territory of the trigeminal becomes anæsthetic, not only the skin of the face, but the mucous membranes of the eye, nose, mouth, and tongue, the teeth, upper jaw, and hard palate on the corresponding side. The back of the tongue and the soft palate escape, these being supplied by the glossopharyngeal. There is a certain risk of ulceration of the anæsthetic cornea, just as after excision of the ganglion.

REFERENCE.—[1]*Arch. f. klin. Chir.* 1912, ci, 193.

NEURASTHENIA, TRAUMATIC.

Bedford Pierce, M.D., F.R.C.P.

Campbell Thomson[1] used "neurasthenia" in a general sense, as a designation for a group of functional neuroses. He maintained that the trauma of the mind is the essential factor of the neurosis, more especially emotion often associated with fear, and that traumatic is not essentially different from non-traumatic neurasthenia. The amount of shock is often out of all proportion to the degree of danger. He laid stress on the importance of observing the length of the latent period, i.e., the interval of time between the shock and the development of symptoms. This in genuine cases he considered was rarely longer than a week or two, and when, as frequently happens, symptoms began long afterwards, they probably were dependent largely upon anxiety, financial uncertainty, the worry of litigation, and repeated medical examinations. He strongly dissented from the view that all cases recover when litigation is over.

The symptoms are attributed to disorder of the sympathetic system and the autonomic centres in the brain and sacral region; but these arise from the inhibition of cortical control and the over-activity of the thalamic centres. The results of the treatment of 60 cases of uncomplicated neurosis, the patients being of both sexes and of all classes, were as follow: 39 were able to resume work, 9 are permanently disabled, 3 became insane, and in 9 cases the results were uncertain.

As regards treatment, he advised change of surroundings, regulation of mental and bodily exercise, and plenty of good food and air. The importance of ensuring complete fitness for work before attempting to resume it, was urged. He stated that the earlier cases are treated the better, but that some had recovered after having been on the compensation list a long time.

An interesting discussion followed the reading of his paper. Savage thought that neurasthenia scarcely existed fifty years ago, and that it was associated with increasing difficulties of environment. He stated reasons for thinking that when an injury occurred to a person in a state of extreme excitement, or when he was drunk, there was a greater risk of damage to the brain. Robert Jones said he had been accustomed to regard neurasthenia as more or less of hysterical origin, but he now conceded that it was an organic entity with definite symptoms, sometimes terminating in definite insanity and associated with general paralysis. He considered it was a physical condition, and that for every mental manifestation there was a definite material underlying condition. Menzies suggested that the damage to the cortical cells which led to over-activity of the thalamic centres and the sympathetic system was due in the first place to disorganization of the serum circulation within the skull. He suggested that there was a possibility that trephining the skull in an area least susceptible to subsequent injury would result in benefit in a number of chronic unpromising cases. Carswell said he could confirm from his own experience that neurasthenic symptoms arose independently of morbid desires to see a physician, anxieties in respect to lawyers, or any wish to remain an invalid. Moreover, these symptoms appeared four months after the injury and the emotional shock. They consisted of pain in the back and in the vertex, aggravated by mental effort. To think out an ordinary letter became difficult; words were omitted and mis-spelt. He had therefore become a believer in statements made by patients about which he had formerly been sceptical.

REFERENCE.—*Jour. Ment. Sci.* 1915, Oct.

NOSE. (*See also* NASAL ACCESSORY SINUSES; NOSE AND THROAT, GENERAL THERAPEUTICS; OTITIS MEDIA; OZÆNA; RHINOLITHS.)

W. G. Porter, M.B., F.R.C.S.

T. W. E. Ross[1] has shown by vital staining that the inferior turbinals have an abundant and complex nerve supply, especially in the sub-epithelial area, where several varieties of nerve-endings are found including a plexus formed by leashes of nerve-fibrils best seen towards the anterior part of the turbinal.

Nasal Thermometry.—Brown Kelly[2] has published an important and entirely original investigation for determining the influence of the nose on the temperature of the inspired air. He used extremely delicate thermometers which responded at once to the slightest change, so that the alternations produced by the colder inspired and the warmer expired air were at once made evident. The bulb of the thermometer, which was bent at an angle to the stem, was introduced into the nasopharynx, while the stem projected from the mouth. The excursus of temperature in normal individuals varied from 1·5° to 6° F. His results thus differ from those of previous observers in that he showed that the temperature of the respiratory current in the nasopharynx was not to be attributed solely to the warming action of the nose and nasopharynx, but also to that of the lungs.

Nasal Deformities.—(*See also* RHINOPLASTY). Marshall[3] has devised an operation for the correction of extreme external lateral deflections, and has performed it with good results in some thirty cases. An incision is made, 0·25 cm. in length, directly over the nasal process of the superior maxilla, and parallel with the normal line of the nose. A chisel of the same width as the incision is applied to the bone, which is then penetrated with a light blow of the mallet, care being taken not to go beyond the bone. The process is repeated on the opposite side. The mobility of the nasal process on each side along its entire line is completed by fracture by means of the Asche septal forceps, one blade of which is placed inside the nose, the other outside. If the nose is not yet straight, the defect lying at the suture between the frontal and nasal bones, the faulty angle can be straightened by a sharp stroke with the mallet in a downward direction and against the deflected side. No splints are employed as a rule.

Carter[4] has corrected nasal deformities by the transplantation of bone. In traumatic cases, a single strip of bone is usually sufficient. In congenital cases, and in those due to destructive disease, it may be necessary to construct a V-shaped wedge for the support of the dorsal strip, by introducing two additional pieces of bone. The strictest antiseptic precautions are necessary, as primary union is a *sine qui non*. A curved incision is carried from the inner end of one eyebrow to the other, a flap is raised, and with a sharp elevator the skin and subcutaneous tissues are elevated over the dorsum and sides of the nose. A short transverse cut is also made through the periosteum over the naso-frontal process. A portion of the ninth rib two inches in length is now excised free of its periosteum, and is then split, the medullary tissue is all scraped away, and from one half, a piece is shaped to suit the deformity. The strip of bone is now introduced below the semilunar skin flap, and the end pushed nearly to the tip of the nose; the upper end is anchored under the slit in the periosteum. The wound is closed with horse-hair sutures. Occasionally additional portions of bone have to be inserted. The author has treated 15 cases in this way; there were

2 failures. In 2 cases the deformity remained corrected but the bone was absorbed. In the remaining cases the bone lived (*Fig.* 42, *a, b*).

Lupus Nasi.—Bedford[5] reports a case of lupus nasi in which Pfannenstill's method of treatment by **Nascent Iodine** was adopted with success. Sodium iodide was given internally, 7½ gr. every four hours, and a solution was applied hourly made up of a pint of a 3 per cent solution of 10 volume hydrogen peroxide, to which had been added 1 oz. of acetic acid (B.P.). The diseased surface healed in eight weeks.

Rhinoscleroma.—Richards[6] records six cases which he met with in Egypt, where the disease is not uncommon. It is a granuloma, which begins as a hard papule in the nose, and in the course of a year or two affects the whole organ. The author treated his cases with a vaccine prepared from the bacillus of rhinoscleroma which was obtained from the tissues, but it was found to be useless. The disease does not occur in Britain.

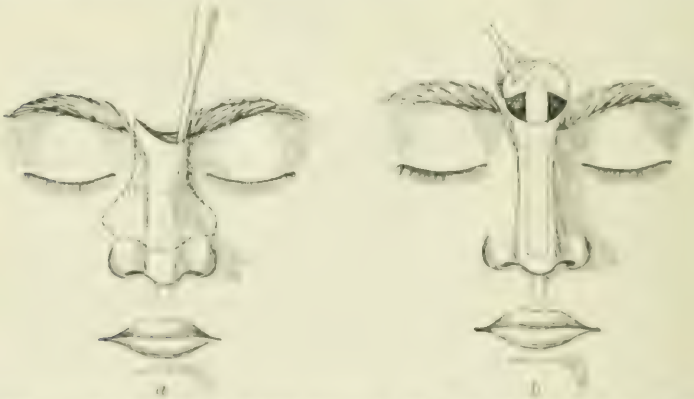


Fig. 42.—Bone transplantation for nasal deformity. (*a*) Shows the method of elevating the skin and subcutaneous tissues; (*b*) The bone in place.

Malignant Disease.—Price-Brown[7] advocates internal operations for the removal of malignant growths of the nose and throat, **Electrical Methods** to have the preference when possible. He has treated 10 cases in this way during the last twenty years, 7 being cases of sarcoma of the nose. The duration of treatment (electrolysis and galvano-cautery) is long; repeated cauterizations having been carried out in these cases for from two months to over two years. The results were excellent, 4 being cured, 2 uncertain, and 1 dying of septicæmia without return of the growth.

Nasopharyngeal Fibroma.—Joseph and Louis Dunning[8] point out that there ought not to be a set operation for the removal of this disease. When possible, removal should be effected through the natural passages, i.e., the anterior nares or the mouth, or a combination of the two. When there are prolongations of the tumour to the pterygo-maxillary region, or when sufficient access is not obtained in this way, it must be obtained by operative means. The authors condemn the classical temporary resection of the upper jaw, and recommend: (1) The transmaxillo-nasal route; (2) The sub-zygomatic route, the latter solely for pterygo-maxillary prolongations. In the first, access is obtained by an external incision as in resection of the upper jaw, then through the maxillary sinus to the nose.

Horgan[9] records two cases in which he accidentally *exposed the meninges* during an intranasal operation. In the first he was opening up the anterior ethmoidal-cell labyrinth, in the second resecting the septum; in the latter case a portion of the cribriform plate was removed. No bad effect followed in either case.

REFERENCES.—[1] *Jour. Laryngol.* 1913, 57; [2] *Ibid.* 515; [3] *Jour. Amer. Med. Assoc.* 1913, i, 179; [4] *Amer. Med.* 1912, 623; [5] *Brit. Med. Jour.* 1913, i, 767; [6] *Ibid.* ii, 741; [7] *Jour. Laryngol.* 1912, 600; [8] *Presse Méd.* 1912, 885; [9] *Jour. Laryngol.* 1912, 591.

NOSE AND THROAT, GENERAL THERAPEUTICS OF.

W. G. Porter, M.B., F.R.C.S.

Vaccines are of undoubted value in the treatment of *catarrhal conditions* of the nose and throat, especially perhaps acute and chronic *rhinitis*. In acute rhinitis, Allen[1] states that the attack may be aborted or greatly shortened, the danger of complications diminished, and the risk of chronicity done away with. Treatment may be begun with a stock vaccine until an autogenous one is available. The following is the dosage he advocates: *pneumococcus, streptococcus*, and *M. catarrhalis* 50 million, *B. influenzæ*, *B. septus*, and *B. Friedländer* 100 million; four or five days later a double dose may be given, which is repeated at weekly intervals if necessary. In chronic catarrhs the treatment is similar.

Harmer,[2] in addition to using ordinary (non-sensitized) vaccines, of which autogenous are preferred to stock preparations, has also employed the sensitized vaccines of Besredka. These consist of live organisms plus antibodies extracted from the serum. They have been used extensively in animals, and are said to be less toxic than ordinary vaccines, while producing immunity more rapidly. Harmer has used only three sensitized vaccines, namely, *streptococcus, pneumococcus, and staphylococcus*, and in all of them the organisms have been killed with phenol before injecting the patient. The first dose may be 50 to 100 million, the second 250 to 500, and the third 500 to 1000. In acute septic infections large doses should be given early and repeated as quickly as possible, and Harmer believes that in these cases sensitized are safer than ordinary vaccines. In acute colds they should be given early, but after the first day till the sixth, only with great caution.

In cases of acute *sinusitis*, Harmer has given vaccines in a few cases, most of which recovered quickly; but as he rightly remarks, it is difficult to determine the influence of the vaccines, as these cases usually recover quickly if treated early by a specialist. In chronic sinusitis, streptococcal vaccines gave fair results, but influenzal, staphylococcal, and coliform vaccines were useless. He believes that in sinus cases a vaccine given before operation is of value, and the same is true of any major operation. In 14 cases of atrophic rhinitis, the results of inoculation were unsatisfactory.

Logan Turner and Bolton[3] have recorded their experience in 50 cases treated by vaccines. In every case an autogenous vaccine was employed; the injections were given as a rule at weekly intervals; the initial dose was generally a small one, the second was double the first, the third double the second, and so on. In 11 cases of persistent nasal catarrh, the results were uniformly good: the discharge either disappeared or was greatly diminished in amount. In 7 cases of frequently recurring colds in the head there were also good results; the acute attacks occurred with much less frequency, and their severity was diminished. Of 9 cases of purulent rhinitis a cure was obtained in 5, improvement in 1, and in 3 no change was observed. Of 18 cases of ozæna, no benefit was obtained in 8, while in 10, more or less improvement followed. Of the 8 which were not improved, Abel's bacillus was cultivated in 6. Of the 10 which improved, Abel's bacillus was found in 9, in pure culture in 6. The dose of bacillus varied from 50 to 500 million. There were 5 cases of accessory sinus suppuration treated by vaccines, in 4 of them after operative interference with the view of accelerating the healing; in 3 of these they appeared to be a useful adjunct in the treatment.

Noon,[4] starting on the assumption which had been proved by Dunbar, that pollen-toxin is a body capable of giving rise to the production of antibodies in animals, and even in hay-fever subjects, undertook experiments to see what degree of immunity could be produced in hay-fever patients by inoculations of pollen toxin. He found it possible to raise the patient's resistance to a marked degree. Extracts of pollen were made, and the measure of the resistance was tested with various strengths; having found this, doses of pollen extract were given subcutaneously. He showed that suitable doses increased the immunity, while unsuitable doses either did not affect it or diminished it. His researches were continued by Freeman,[5] who gave a record of 20 cases treated by pollen vaccines. The results on the whole were satisfactory.

Salvarsan.—Gerber[6] in a review of the literature finds that excellent results have been obtained in the treatment of primary sores in the mouth and throat, healing taking place in from three to ten days, while secondary efflorescences disappear in twelve to thirty-six hours, most rapidly after intravenous injection of 0·3 to 0·6 salvarsan. Equally satisfactory results are realized in the later stages in ulcerations of the pharynx, gummata, and malignant syphilis. In the nose also, magnificent successes have been obtained, even in extensive destructive processes which have resisted repeated courses of treatment with mercury. In the larynx, the secondary manifestations disappear much more slowly after the injection of salvarsan than do those in the pharynx, but it is especially in cases of syphilitic stenosis of the larynx, both recent and old, that salvarsan has proved itself to be of value. This has been so frequently observed, that it may now be stated as a definite rule that tracheotomy should not be resorted to in syphilitic stenosis without first trying the effect of salvarsan. It has also been employed in non syphilitic affections of the air-passages. These may be divided into diseases caused by spirochætes and those not so caused. In the former class, many successful results have been obtained, notably in cases of Plaut-Vincent angina. In the latter, any success that has been obtained must be attributed to a secondary infection by spirochætes.

Whale[7] has treated sixteen cases of syphilitic disease of the nose and throat with various arsenical compounds, and concludes that salvarsan and its allies offer a fair prospect of arresting tertiary syphilitic lesions of the bones or cartilages of the nose and throat, syphilitic laryngitis, and non-ulcerative inflammations of the pharynx and nasopharynx. When repeated injections are not contraindicated either by technical difficulties or by unwillingness on the part of the patient, neo-salvarsan is the safest preparation to use.

REFERENCES.—[1]"Vaccine Therapy," 4th ed. London; [2]*XVIIth Internat. Congr. Med.* 1913, section xv; [3]*Ibid.*; [4]*Lancet,* 1911, i, 1572; [5]*Ibid.* ii, 814; [6]*XVIIth Internat. Congr. Med.* 1913, section xv; [7]*Lancet,* 1913, ii, 218.

ŒSOPHAGUS. (*See also* BRONCHOSCOPY.)

W. G. Porter, M.B., F.R.C.S.

Malignant Disease.—Logan Turner[1] states that out of 113 patients who complained of difficulty in swallowing, a diagnosis of malignant disease was made in 68; in the remaining 45 cases an exact diagnosis was not arrived at for various reasons; probably a number of these were also malignant. Cancer may attack any part of the œsophagus, but the upper and lower ends are more commonly affected than the centre. Of the 68 cases, 62 involved the upper end and 6 the lower. The author subdivides the first group into two sub-groups, one in which the tumour undoubtedly involved the hypopharynx or post-cricoid region, and the other in which the disease was either confined to the upper end of the œsophagus or, if it had infiltrated the hypopharynx also, it was not evident there on laryngoscopic examination. The subdivision was made on clinical grounds because: (1) The disease could be recognized in the hypopharynx by means of the laryngoscopic mirror; (2) It occurred in women much more frequently than in men; (3) It affected women at an earlier age than it did in other situations; (4) The disease was of shorter duration in this situation than when in the œsophagus. The following subdivision was therefore made: hypopharynx, 26 cases, or 38 per cent; upper end of œsophagus, 36 cases, or 52 per cent; lower end, 6 cases, or 8 per cent. Of the 68 cases, 26, or 38 per cent, were males, and 42, or 61 per cent, were females. This preponderance of the disease in the female sex is contrary to the experience of Butlin, Morell Mackenzie, and other writers. It was specially marked in the hypopharynx, i.e., 19 females to 7 males, while at the lower end of the œsophagus the male sex was more commonly affected, i.e., 5 males to 1 female. The incidence of the disease is younger in females than in males; the majority of the women were affected between the ages of thirty and fifty; the majority of the men, on the other hand, after fifty years of age.

DURATION OF THE SYMPTOMS.—These varied considerably; in a few of the cases it was quite short, and was misleading as to the probable duration of the disease. This was due to the fact that in some instances the patient suddenly became conscious of obstruction in swallowing; after this onset, dysphagia remained permanently. In the great majority of cases it extended over a long period, varying from a few months to several years. There is a tendency to regard some of these long cases as functional, but Turner insists that such a diagnosis should be emphatically condemned. The duration of the disease varied remarkably; this was due to the inability to fix the date at which it probably began. In the author's series the date of death was ascertained in 34 cases. In 3 gastrostomy had been performed. In the remainder no surgical interference was carried out. On an average, death supervened in three months after the examination. In two of the cases which had been operated upon, death occurred within a few days, and the third terminated fatally after four months.

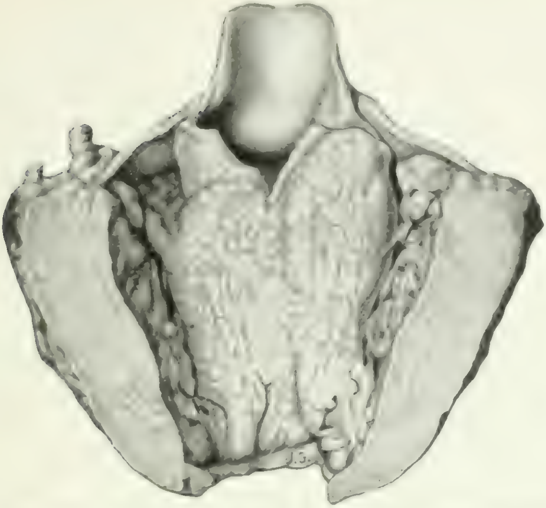
SYMPTOLOGY.—The author has noted that pain, usually a dysphagia, is in some cases a prominent symptom, while in others it may be absent throughout the whole course of the disease. Its presence or absence was enquired into in 41 cases, and it was found to exist in 34, while in 7 it was entirely absent. Emaciation is a prominent, and often a rapidly progressing, feature. Cough is occasionally troublesome. The accumulation of mucous secretion in the lower part of the pharynx is a frequent and disagreeable symptom, and is often demonstrable on laryngoscopy; but the presence of blood is exceptional. Hoarseness occurs either as the result of involvement of one of the recurrent laryngeal nerves, or from direct invasion of the larynx by the disease. The symptom was present in 17 cases at the time of examination, while in several others it developed at a later date.

PHYSICAL EXAMINATION.—The presence of enlarged cervical glands was noted in a number of cases, most commonly in tumours affecting the hypopharynx. Laryngoscopy is an essential part of the examination. Abnormal secretion behind the arytenoids was observed in 13 cases. Actual changes were observed with the mirror in 43, i.e., 63 per cent of the cases. Interference with the mobility of the cord was noted in 22, or 32 per cent; there was paralysis of one cord in 13 cases, the right cord being affected in 4, the left in 9, while in the remaining 9, the fixation was due to infiltration of the crico-arytenoid region by the tumour, and not to paralysis. The other changes were mainly of the nature of tumour infiltration. In cases classified as malignant disease of the hypopharynx, part of the tumour was visible, usually as an ulcerated infiltration lying across the deepest part of the posterior pharyngeal wall. In addition, one or both arytenoid regions

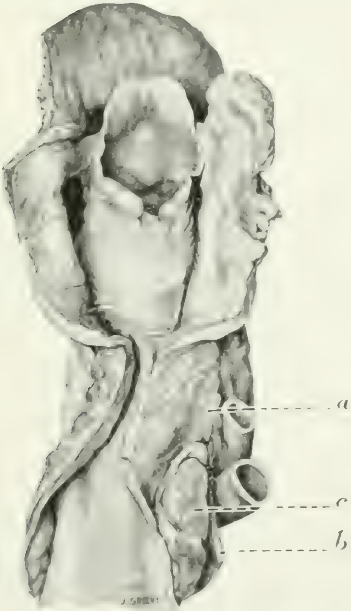
PLATE XXVII.

EPITHELIOMA OF THE ŒSOPHAGUS

([illegible])



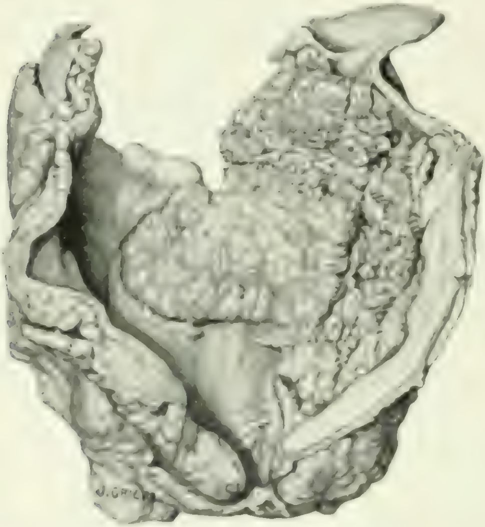
[illegible] Duration of symptoms, [illegible] years.



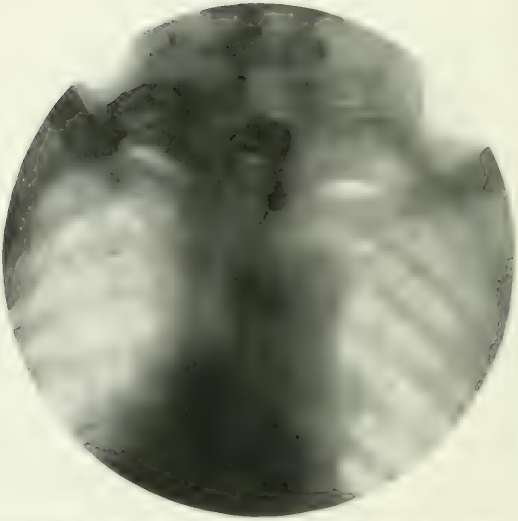
[illegible] Duration of symptoms [illegible] (a) [illegible] œsophagus with [illegible] recurrent laryngeal nerve passing into it; (*b*) right recurrent laryngeal nerve; (*c*) enlarged [illegible]

PLATE XXVIII.

EPITHELIOMA OF THE ŒSOPHAGUS



[illegible]



[illegible]

[illegible]

may be swollen, or there may be obvious tumour infiltration of these areas. (*Plate XXVII, Fig. A*; *Plate XXVIII, Fig. C*.)

The use of bougies is deprecated by the author, because when the clinical history points to obstruction of the gullet, no further advantage can be derived. In some cases it will enable us to say that the obstruction is situated at so many inches from the incisor teeth, but that is all that can be gained from the introduction of this instrument. It gives no information as to the cause, nor as to the nature of the stricture, whether fibrous or malignant, or whether from pressure upon its walls. Moreover the bougie is not free from danger, and fatal accidents have followed its introduction: the instrument may be forced through the ulcerating base of a malignant tumour and death result. The *x*-rays afford a safer and wiser procedure in determining the position and length of the stricture, and by means of bismuth porridge and the fluorescent screen, we may also determine whether the cause of the obstruction is in the walls of the œsophagus itself or in compression by neighbouring structures. Of course a diagnosis of malignant disease cannot be made by this means; but œsophagoscopy is necessary, and by a combination of the two sufficient information is obtained to determine the possibility of removal of the strictured portion. Carcinoma is not always readily recognized through the œsophagoscope, and two or three examinations may be necessary; 24 cases in the author's series were so examined. Where the disease could be seen by the use of the laryngoscopic mirror, œsophagoscopy was not employed.

Bassler[2] has devised a new technique of *x*-ray examination of the œsophagus, with the object of holding the bismuth in the œsophagus, and so obtaining a sharp outline of its walls. He uses a four-foot length of rubber tubing, 4 mm. in diameter, to which is attached a rubber bag covered with a reinforcement of silk, and having a brass tip at its lower end to give it weight. At the upper end of the tube is a cock. The tube is passed in the usual manner of a stomach tube beyond a mark about 40 cm. from the upper end of the bag, which is then in the stomach, after which it is filled with water by means of a syringe. The cock is closed, and the tube pulled on so that the bag is drawn into the funnel shaped cardiac orifice of the stomach, and the external end held lightly at this point. A bismuth mixture is now run into the gullet by means of an ordinary urethral catheter, and photographs are taken with the patient standing in the lateral dorsal position with the left back to the plate.

Surgical Treatment.—Willy Meyer[3] discusses the surgery of cancer of the œsophagus. He insists that the moment a case is diagnosed it should be handed over to the surgeon, and that there is hope of a successful issue if the disease is limited to the œsophagus, for growth is slow at first, and metastases are late in forming. The operative method of choice is a gastrostomy by Jianu's operation, in which a part of the greater curvature of the stomach is dissected and formed into a long gut-like tube, one end opening into what is left of the stomach, the other end being free. This is drawn up extrathoracically below the skin or pectoral muscle to a point above the mammary gland, and at a second sitting, after resection, the oral end of the œsophagus having also been transposed extrathoracically, the connection between the mouth and stomach can be completely restored. This method is available in cases in which the carcinoma is situated above, behind, or right below the aortic arch. When the cancer is in the lower third of the œsophagus, intrathoracic œsophagoplasty might be performed. Besides Torek's successful case (*vide infra*), the author refers to another operated on by Zaaiger[4] in January, 1913.

Torek[5] records the first successful case of *resection of the thoracic portion of the œsophagus* for cancer, in a woman, aged 67. The chief difficulties are obtaining access, avoiding injury to the vagi, and doing away with the risk of leakage from the proximal stump after resection. He obtained access by carrying the incision through the whole length of the seventh intercostal space, from the posterior end of which it was extended upwards by cutting through from the seventh to the fourth ribs near their tubercles. The œsophagus was exposed by dividing the pleura and drawing aside the vagi, of which some branches crossing the tumour were divided without affecting the pulse. Great difficulty was experienced at the site where the œsophagus passes behind the arch of the aorta, which was dislodged and lifted forward after division and ligation of some of its thoracic branches. The œsophagus was then liberated from its attachments all the way up to the neck, divided below the tumour with a cautery after double ligation, and brought out with the tumour through an incision in the neck at the anterior border of the left sternomastoid muscle, so that the pleural cavity should not become infected from the upper stump. The lower portion was invaginated like an appendix stump, but two successive purse-string sutures of silk were used. The thorax was closed without drainage. The œsophagus, which was hanging out from the wound in the neck, was placed under the skin of the chest, and its fresh rim sutured to the skin. After eight days, the free end of the gastrostomy tube (gastrostomy had previously been performed) was introduced into the cut end of the œsophagus for the purpose of feeding the patient.

[illegible],[6] in the *palliative treatment* of carcinoma of the œsophagus, has found **Olive Oil** of value when the stricture has not been complete. He has given **Morphia** and **Atropine** half an hour before meals; this overcomes the spasm of the muscular walls of the œsophagus. He has also found benefit result from the injection of **Peroxide of Hydrogen** in 1 to 2 per cent solution. A teaspoonful is swallowed every hour. This treatment may be continued for weeks or months.

Cicatricial Stricture.—[illegible][7] divides burns of the œsophagus into three classes:—(1) Burns of the first and second degree, limited to the epithelial coat of the mucosa, which heal in a few days leaving no trace; (2) Those of the third degree, in which the epithelial layer is destroyed, healing with a cicatrix; (3) Those of the fourth, fifth, and sixth degrees, in which the mucosa, the submucous layer, and even part of the muscular coat, are destroyed; here healing is very slow.

and ends in stricture, which may be complete. The author differentiates clinically between cases which on œsophagoscopy are permeable to a bougie passed under guidance of the eye, and those which are not. In the former he gives **Thiosinamine**; if this fails after twelve injections, he dilates with graduated **Bougies**, or treats by **Electrolysis**, or internal **Œsophagotomy.** The last method is dangerous. In the latter class he advocates **Gastrostomy** as a first step. In many cases, rest of the œsophagus relieves spasm and permits a fine bougie to be passed. The author prefers a rubber tube, which he leaves in place ten to twelve hours, replacing it by larger and larger sizes. Where rest is not effective, he employs retrograde œsophagoscopy, and an attempt is made to pass a fine bougie through the stricture. When cases are seen shortly after the burn, no intra-œsophageal treatment is permissible until after the lapse of weeks or months, when the œsophagoscope shows the burn itself is completely healed.

Moure,[8] at the French Congress of Surgery, advocated slow dilatation of a stricture in preference to rapid divulsion or internal œsophagotomy. Electrolysis was also dangerous, though it might give good results. Dilatation by direct vision, by means of the œsophagoscope, was of special value. Gastrostomy was of value, when dilatation failed, by giving rest to the œsophagus and relieving spasm; this might be followed by retrograde dilatation. Where this fails, œsophago gastrostomy, or œsophagojejunogastrostomy, might be performed.

Sargnon and Alamartine[9] have treated 24 cases of cicatricial stenosis of the œsophagus. In 3, dilatation without œsophagoscopy was successful. In 7 cases œsophagoscopy followed by dilatation with bougies was carried out. In 8 gastrostomy had to be performed, followed by dilatation by endoscopic methods through the stomach or mouth, or both. In 2 cases gastrostomy and internal œsophagotomy, and in 2, gastrostomy and external œsophagostomy were performed. In 2 congenital cases the patient's condition was too grave to allow of operative treatment. The authors lay great stress on the value of gastrostomy as an operation of emergency when the patient is starving, and as the operation of choice when the stricture does not yield to dilatation through the mouth. This is followed by retrograde dilatation.

Walker Downie[10] believes that *syphilis* is a not uncommon cause of œsophageal stenosis, and has observed 11 examples, 9 in women, out of 100 consecutive cases of stenosis of the gullet. The patients frequently have fissures at the angles of the mouth, and glossitis, and a history of secondary lesions may be obtained. Œsophagoscopy is not of much aid in differential diagnosis. The condition is amenable to treatment, which consists of **Antisyphilitic remedies** and **Dilatation** of the stricture by bougies. Dr. Hill, in discussing this paper, was not convinced that the author's claim of having observed 11 cases of syphilitic contraction of the gullet could be accepted. He had only seen one case out of more than 180 examined, and Guisez had only seen one syphilitic stricture in over 800 gullet cases.

Peptic Ulcer.—Watson[11] records two cases of peptic ulcer of the œsophagus. In the first case, where the ulcer perforated into the left pleura, a diagnosis of perforated gastric ulcer was made; in the second, diagnosed as gastric ulcer, no perforation occurred. In both the abdomen was opened on account of acute abdominal symptoms and nothing abnormal was found. Both cases ended fatally.

Cardiospasm.—Myer and Carman[12] have observed 14 cases of cardiospasm, with the after-treatment in 8 of these. Cardiospasm may be preceded by gastric symptoms, or the origin may be sudden. In the former case, pain radiating from the epigastrium to the hypochondriac regions, and the complaint of a "lump in the stomach," have been common. Shortly after, difficulty in swallowing is experienced, and becomes more marked, till only fluids can be taken. There then occurs dilatation or sacculation of the œsophagus, and large quantities of food are eructated. On passing a bougie an obstruction is found 40 to 45 cm. from the teeth. In order to determine the amount of sacculation, a stomach tube is introduced into the œsophagus with a thin rubber intragastric bag attached. Water is gradually injected into this until the patient complains of considerable discomfort, when the amount of water may be removed and measured and an idea of the degree of sacculation obtained. A normal œsophagus will not admit more than 40 to 60 c.c. of fluid. Radiography may also be employed. Œsophagoscopy is of value in the differential diagnosis from carcinoma and stenosis due to scars. The authors have successfully treated these cases by **Divulsion** by hydrostatic pressure by means of a silk-rubber bag from 3 to 3·5 cm. in diameter. In the authors' experience, though the patient may be made reasonably comfortable, he can never be restored to a perfectly normal state. He must not eat rapidly, the reason being that the sacculation persists, as the authors have demonstrated, even four years after the "cure." Dilatation is carried out twice weekly for two or three weeks, then each week until the symptoms have been entirely relieved.

Lerche[13] has had an experience of 17 cases. He measures the capacity of the dilated œsophagus by means of his œsophagometer, a large thin rubber bag introduced into the œsophagus by the aid of a wire stylet; the bag is distended with air, which is drawn off and measured. Œsophagoscopy is the most important method of examination. It is essential to exclude lesions such as ulcer or new growth before commencing treatment. He also treats cardiospasm by stretching the lower end of the œsophagus with a silk rubber bag attached to a stomach tube, which is introduced into the epicardia-cardia by a wire stylet and distended by air or water. The author dilates to 40 mm. using about 10 lb. pressure. For the treatment of the catarrhal condition of the mucous membrane, he has used **Nitrate of Silver** solution, injected through a fine silver cannula.

Plummer[14] has treated 91 such cases, also by dilating the cardia with a hydrostatic dilator. Of these, 73 were completely relieved of the dysphagia, 11 were not completely cured, 3 could not be traced, and 4 died of various causes, 1 from rupture of the œsophagus. The œsophagus was dilated in the first 30 cases with a pressure of 500 to 575 mm., in the next 31 with a pressure of 675 mm., in the last 45 with a pressure of 575 to 600 mm. Usually, two or three treatments were given, and the patients then sent home.

Einhorn[15] also records several cases. One of these patients complained of nothing but cough during or immediately after eating. The authors lays special stress on the value of Meltzer's swallowing-sound in diagnosis; if occurring at once, or seven seconds after deglutition, œsophageal dilatation is not present. If delayed twelve to twenty seconds after swallowing water, cardiospasm is frequently present. Mild cases quickly improve under the influence of a sedative. In severer cases the forcible stretching of the cardia by means of a cardiodilator is essential.

Examination of Œsophageal Lesions.—Plummer[16] bases his technique on an experience of some 300 cases. He divides the methods into three, i.e., *radiography*, *œsophagoscopy*, and the various methods of *sounding*. Radiography discloses thoracic masses obstructing the œsophagus from without, and reveals the position, size, and relations of diverticula and dilatations when filled with bismuth mixtures. In passing sounds, the author has found Mixter's method of using a silk thread as a guide of great value. The patient swallows six yards of silk thread; this passes down through a sufficient number of coils of intestine to prevent its withdrawal on being pulled taut. With the whalebone staff or olive passed on the thread, pockets may be located, stricture dilated, and the rigidity estimated.

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OPERATIONS, COMPLICATIONS FOLLOWING.

Priestley Leech, M.D., F.R.C.S.

Beckman[1] analyzes the post-operative complications and deaths in a series of 5835 surgical operations performed in 1912 in the Mayo clinic. These were all in-patients, and therefore serious cases.

Infections following surgical operations may be regarded in two ways. First, all patients may be regarded as infected before any operation is performed, and when suppuration occurs the surgical technique has failed to overcome the infection. The normal tissue resistance to bacterial invasion may be lowered by prolonged sickness, a severe surgical operation, or long-continued absorption from a neoplasm; the normal bactericidal properties of the tissues are interfered with, and so the bacteria flourish. Secondly, many surgeons regard the tissues of the body as being sterile, and if infection occurs they at once assume the offending organism has been introduced from outside. It must be remembered that pathogenic bacteria may be in the tissues or introduced from some outside source or both, and it is only occasionally that the source of the infecting organism can be found. For several years every infection occurring in the clinic has been investigated, but it is seldom that any definite conclusion has been reached. An infection has never been traced to the suture material used. In this series of cases, every wound that failed to heal by primary union was regarded as infected; many such only discharged a few drops of serum, and a considerable number of such cases showed no growth in the cultures taken from this discharge from the wound. The total number of infections was 111, or a percentage of ·019 for the 5835 patients. There were no deaths. Nearly one-sixth of the total infections followed operations on the stomach and intestines. There were a considerable number of infections in appendicectomies, and where a small McBurney incision was made, an infection was rarely seen. Latterly large incisions have been made, and the infections have become more numerous; but the thorough abdominal exploration which has been made by introducing the hand through the larger incision has more than offset the risk of slight infection.

Pulmonary Complications.—Embolism occurred in three cases. There were twelve cases of pneumonia, but none could be attributed to the anæsthetic, although ether is almost exclusively used in the clinic.

Thrombophlebitis.—The total number of cases was sixteen. No causative factor was determinable. A middle course has been taken as regards getting the patients out of bed. Most laparotomy patients are kept in bed from eight to twelve days, except those having simple appendicectomies, who are allowed to get up on the sixth or seventh day following operation. Three-fourths of the cases of phlebitis were in the left femoral or external saphenous vein, and one-fourth were in the right; none were double. It was not definitely determined that patients with an infected wound are, or are not, more likely to develop phlebitis than so-called clean cases. In only one of the sixteen cases had the patient an infected wound. In one there was phlebitis in the arm following an operation on a perineal fistula. The usual treatment has been elevation of the leg, with hot applications.

Acute Dilatation of the Stomach was only seen once in a case of cholecystostomy and posterior gastro-enterostomy for duodenal ulcer. He thinks this complication has been avoided by early and frequent washing of the stomach. Whenever a patient has vomiting or regurgitation of bitter fluid from the stomach, although there is no real vomiting, routine lavage is employed. Three cases only developed a mild cellulitis.

Post-operative Embolism.—Wilson[2] presents the records of fatal post-operative embolism in the operations in St. Mary's Hospital, Rochester, Minnesota, from September 13, 1899, to December 31, 1911; out of 57,000 major operations there were 47 fatalities due to this accident

Autopsies were made in 41, and the clinical diagnosis was quite positive in the remaining 6. The mortality is 0·07 per cent, or one death in every 1352 operations. In 36 the embolism was pulmonary, in 10 cerebral, and in 1 coronary. In 32 of the 41 cases examined post mortem, the location of the originating thrombus was found in the field of operation or femoral vein. In 4 cases the origin was probably in the heart and in the remaining 6, the source was undetermined. Arteriosclerosis was found in 5 cases, chronic myocarditis in 11, chronic nephritis in 14, and chronic hepatitis in 18.

During the first ten years from September 30, 1889, to September 13, 1899, out of 6000 major operations, no cases of fatal embolism were reported. Why should one case in every 1213 die of this complication in the next ten years' history of the hospital? Ether has always been the anæsthetic, the staff has not changed, and the procedure has been the same. The only changes coincident with the increase are, first, in the nature of the operations (in the latter ten years there have been more operations in the stomach, gall-bladder, lower bowel, prostate, and hysterectomies, and it is subsequent to operations on these organs that most of the fatalities have occurred); and, second, in the condition of the patient coming into the hospital and to the operating-table, which has materially changed since the first decade. During the first ten years a very large proportion of the surgical cases were drawn from the general family practice of the members of the hospital staff, and were operated on before they were in extremis. During the last twelve years the surgical material has consisted almost entirely of referred cases, with an ever increasing percentage of those of the "last resort" type, and it is this class in which most of the emboli have occurred.

The most important factors concerned in extensive *post-operative thrombosis* are as follows: (1) Injury of the vascular wall; (2) Slowing and stagnation of the blood-stream. After operations, the rapidity and volume of the current in the veins are materially lessened for a considerable distance proximal to the first incoming venous radicles; also the patient is kept in a recumbent position, thus reducing the force and rapidity of the heart's action, and causing a general slowing of the blood-current throughout the entire vascular system, including the heart; (3) Disintegration of the corpuscles of the blood from toxic substances. It has been suggested that this factor may account for the high percentage of post-operative emboli following gall-bladder operations; (4) Bacteriæmia.

The following suggestions are made for the prevention of post-operative thrombosis and embolism. Vascular traumatism at operation should be reduced to a minimum by the conservative occlusion of vessels, and provision of free drainage to prevent later extensive external pressure on vessels. Very early free movement on the part of the patient should be encouraged as soon as the nature of the operation and danger from hæmorrhage will permit; the reported results of early getting-up after laparotomy are unconvincing as to the reduction of post-operative embolism. Early movement may be bad if extensive thrombi have already formed. The pre-operative administration of drugs to increase the coagulability of the blood, e.g., calcium salts in hepatic disturbances, is of questionable value so far as thrombosis and embolism are concerned. Measures looking toward the reduction of bacteriæmia are certainly indicated as a pre-operative precaution for the prevention of thrombosis and embolism. Where possible, the preliminary destruction (as with a cautery) of local foci of infection should be considered. When the invading organism can be isolated and identified, a preliminary vaccination is suggested. In some instances, this might prove of material benefit in avoiding post-operative infections other than those of the vascular systems.

Burnham[3] comes to the conclusion that post-operative thrombophlebitis is an infectious disease. It occurs at an earlier date in "clean" than in drainage cases. **Rest in Bed** seems to be the only therapeutic measure capable of exerting any marked influence on the severity and course of the disease. **Ichthyol** seems to have a direct and constant influence on the local pain.

References.—[1]*Ann. Surg.* 1913, i, 318; [2]*Ibid.* 1912, ii, 890; [3]*Ibid.* 1913, i, [illegible]

ORCHITIS, ACUTE PRIMARY. *Frederick Langmead, M.D., F.R.C.P.*

Etiology.—Acute primary inflammation of the testicle in children, for which no definite cause is manifest, has been ascribed to masturbation and to acute tuberculosis. L. Ombrédanne, from observation of seven such cases, believes that they are more correctly to be attributed to torsion of the gland.

Symptoms.—He describes a characteristic case. A boy, aged from 10 to 15, presents himself for pain in the scrotum, stating that it appeared quite suddenly two or three days before. Previously, he may have experienced it in the same position, but not so severely. The scrotum on one side is red, œdematous, and may be adherent. Palpation of the testicle is painful, and the boy strongly resists examination. The gland may be considerably enlarged as compared with that on the other side. The epididymis and testicle cannot be distinguished from one another. The vas is often swollen and tender, especially at its lower end. There are fever, nausea, and want of appetite. With rest in bed the swelling may decrease and the symptoms improve, so that in a few days the boy is discharged. In some cases, in the succeeding months, the testicle gradually atrophies. On the other hand, the swelling may increase and an abscess may form which has to be evacuated. Pus is found in the tunica vaginalis. Recovery may follow in a few weeks, or shreds of necrotic testicular substance may be discharged, before the wound heals.

Treatment.—He urges that in all apparent cases of acute primary orchitis the likelihood of torsion of the testicle being the real nature of the malady should be borne in mind. Since, in cases of doubt, irreparable damage may ensue, it is unwise to wait, and an operation should be performed. He recommends fixation of the tunica vaginalis to the scrotum if the torsion is above the tunica, and fixation of the testicle to the tunica vaginalis and the latter to the scrotum if the torsion is within the tunica.

Reference.—[1]*Presse Méd.* 1913, 595

OSTEO-ARTHRITIS OF HIP. (*See* Hip, Osteo-arthritis of.)

OTITIS MEDIA.

Geo. L. Richards, M.D.

Adair Dighton[1] considers the nasopharynx the origin of 90 per cent of aural diseases. *Catarrh of the Eustachian tube*, acute and chronic, is the most common condition found from an inflamed nasopharynx. The picture of the pharyngeal orifice is important in its diagnosis and treatment. Any acute catarrhal salpingitis can usually be cured by an application of **Silver Nitrate** or any of its proprietary preparations, such as **Argyrol, Sophol,** or **Protargol,** applied directly to the pharyngeal orifice, and if the catarrhal condition is due to pathological lesions, such as enlarged pharyngeal tonsils, a deflected septum, hypertrophied turbinates, or adenoids, these should first be removed. To diagnose and treat chronic catarrhal salpingitis and chronic atrophic salpingitis correctly, it is essential to ascertain the patency of the tube and to know whether the pharyngeal orifice is hyperplastic or atrophic. In chronic catarrhal salpingitis of the hyperplastic type, the patency of the tube can be restored by first reducing the inflammatory condition of the orifice, and then passing bougies along the tube, and by intratubal injections of nitrate of silver solutions. Chronic suppurative otitis media, of not longer than four weeks' duration and not complicated with bone infection, can be cured by the treatment of the Eustachian tube, combined with the cleansing of the tympanic cavity and drainage by means of position. Gyergyai[2] has devised a metal dilator with which to stretch the pharyngeal end of the Eustachian tube. It is introduced through a pharyngeal speculum of the straight type, either that of the author or Yankauer's. The results in a series of cases already treated by usual methods without satisfactory results were very gratifying, marked improvement in hearing taking place. It is offered as an addition to, and not as a substitute for, other methods. The dilator is moulded to the shape of the membranous Eustachian tube, as determined by experiments on the cadaver.

Bacteriology.—Sondern[3] believes acute otitic infections are due chiefly to streptococci, with other common organisms in the following order: staphylococcus, pneumococcus, Str. mucosus. The prognosis concerning the possibilities of the extent and virulence of the infection cannot be defined by the type of infection. A bacteriæmia denotes infection of the general blood-current, but is not sufficient of itself for a diagnosis of sinus, bulb, or vein involvement. Cases of bacteriæmia with and without sinus phlebitis present different clinical pictures, and the positive blood-culture does not aid in the differential diagnosis; on the other hand, negative blood-cultures do not exclude sinus thrombosis, and any suggestive symptoms call for repeated cultivations.

Clinical observations and laboratory aids are often more helpful in making a diagnosis than blood-cultures. The leucocyte count, particularly the differential count, is of value in surgical otology, and according to Urbantschitsch much importance is attached to the coagulation period of the blood; in instances where the coagulability was increased, there was sinus thrombosis, whereas if it was retarded there was none.

Dixon[4] believes micro-organisms are most frequently found in acute suppurative processes of the middle ear in the following order: Str. mucosus capsulatus, streptococcus pyogenes, pneumococcus, and staphylococcus. In cases in which the first of these is present even after the pulse and temperature become normal, pain and tenderness disappear, the blood-count becomes normal, but an otorrhœa exists, an exploratory mastoid operation should be performed. The blood-count in simple acute mastoiditis will normally range to 18,000, with an average of about 11,000 to 12,000 leucocytes. The polynuclear count averages about 70 per cent, at times 80 per cent. A leucocytosis of over 20,000 indicates the presence of some complication, as meningitis, while one of 25,000 or over suggests pneumonia. A leucopenia may be the first indication of typhoid fever as a complication. The blood-count gives an excellent indication of the patient's resistance or the onset of complications, but little of the condition of the mastoid. The *x*-ray plate, when it gives positive evidence of mastoiditis, taken in connection with the clinical symptoms, settles the diagnosis and makes a mastoid operation imperative without delay. In either streptococcal or pneumococcal infection there may be a sudden increase in the polynuclear count, with or without total leucocytosis. In this condition an *x*-ray plate settles the question of mastoid operation, though clinical symptoms oppose it.

SYMPTOMS.—*Exanthematic Otitis.*—Borden[5] bases his remarks upon the following clinical cases: scarlet fever 740 cases, otitis media in 11 per cent.; measles 430 cases, otitis in 28 per cent.; diphtheria 662 cases, otitis in 2·6 per cent.; mixed infection 68 cases, with otitis in 44 per cent. There were 333 autopsies. He finds that in measles, middle-ear and mastoid symptoms occur during the height of the active process. Adults are not very liable to mastoiditis in scarlet fever. In diphtheria, otitis media and mastoiditis are not as active as in scarlet fever or measles, so that the diagnosis is far more difficult to make. With active inflammation in the heart, lungs, or joints, infection of the middle ear or mastoid cells causes the inflammation in these organs to become more active and dangerous; but these visceral lesions are usually much relieved after a prompt and efficient treatment of the aural inflammation. With the appearance of active symptoms in the heart, lungs, or joints, one or both middle ears often show marked signs of inflammation, or rupture spontaneously. If at such times the middle ear or mastoid cells send bacteria into the blood-stream, the devitalized organs are in a position to absorb them, and they themselves become foci of infection to increase still further the patient's toxæmia. The author cites four diphtheria patients who were not particularly ill upon entering the hospital. Each improved or showed no symptoms for sixty-seven, forty-four, eight, and ten days respectively. Then they developed weakness or prostration, and gradually died without any definite symptoms. The autopsies showed double acute middle-ear disease in all; and either single or double mastoiditis in three of the four. Not one of them gave any reason to suspect the middle ear during life. In view of the large percentage of aural involvement in severe and fatal cases, the closest possible watch must be kept on the middle ear. This will reveal many inflamed and swollen drum membranes. Once determined, this condition is easily handled; but as distinct sterotyped symptoms are lacking, the observer should look carefully for the merest suspicion of trouble in this locality, and possess sufficient skill to note the slightest trace of altered natural conditions.

To establish drainage in a comparatively healthy patient is simple enough, but to keep it open in a severe case is an entirely different matter. Repeated drum incisions are often called for, and should be resorted to as long as necessary. Operations under ether should be avoided as much as possible when important organs are involved; but they are never absolutely contraindicated when necessity demands. The free drainage of pus with its attending toxins will do far more good than ether will do harm. Ice-bags should never be used in patients with contagious diseases. The development of symptoms in the middle ear or mastoid should be encouraged as much as possible. Ice-bags and other cold applications effectually mask the symptoms. The matter of prompt and thorough treatment cannot be too strongly emphasized. Practically every case of brain abscess and every infected jugular vein result from failure to diagnose and treat comparatively simple conditions in the early stages.

Phillips[6] describes a type of persistent otorrhœa in children which appears at first as an acute middle-ear suppuration, usually following one of the exanthemata, influenza, or pneumonia. The discharge from the onset is profuse and persistent, continuing beyond the third to the seventh day after the temperature has become normal and the pain has subsided, and there is no marked dropping of the postero-superior canal wall. When it continues longer than three weeks and does not yield to local measures, it suggests involvement of the aditus and mastoid antrum, and in such cases the author has obtained excellent results by combining the simple **Mastoid Operation** with **Post-auricular Drainage.** In young children, when the operation has been performed any time between four weeks and three months, the results have been excellent. In patients with markedly hypertrophied tonsils and adenoids, when the purulent otorrhœa has extended beyond the febrile stage, it is best to delay post-auricular drainage until after the removal of the tonsils and adenoids. The advantages of this operation are that it terminates quickly an otherwise persistent otorrhœa, prevents a chronic purulent otitis media, insures against further extension of local bone necrosis, and restores and retains the hearing function.

Chronic Middle Ear Disease.—Shambaugh[7] suggests, in the place of the term "chronic catarrhal otitis media," the use of the terms "chronic simple otitis media" and "chronic non-purulent otitis media," as better expressions of the fundamental condition, which is that of infection in the membranous lining of the middle-ear chamber, with round-cell infiltration and thickening and subsequent formation of fibrous connective tissue. This process is from time to time associated with an acute infection in the nasopharynx, and at these times secretion can usually be detected in the tympanum, not by inspection of the drum membrane, but by inflation through the tube. The chronic middle-ear process may or may not be associated with a persisting tubal occlusion. The membrana tympani, even when not retracted, usually appears more or less thickened and opaque enough so to indicate the type of process involving the membrane lining the tympanum. The degree of retraction of the drum membrane is no index to the defect in the hearing, or of the improvement to be expected from inflation. The prognosis as regards relief of the deafness is better if the occlusion of the tube has disappeared. Persistent tubal occlusion indicates a still active process, and foreshadows further increase in deafness. The presence of secondary changes in the labyrinth, best detected by noting the defect for the higher notes of the Galton whistle, makes the prognosis bad. The defect in hearing found in cases of persistent tubal occlusion, especially if secretion is in the tympanum, is more readily improved by treatment.

Tuberculous Otitis.—Long[8] considers primary tuberculosis of the middle ear rare, infection taking place by way of the Eustachian tube and external auditory canal. Bacteriological examination of the discharge will determine the localization and character of the disease. If operation is necessary, the radical type is the only one to be considered.

Prognosis. *Hearing Tests.*—Bennett[9] gives the following principles for hearing tests in connection with the prognosis in middle-ear diseases, the prognosis depending very largely on the results of these tests. While well known to aurists, they are here reproduced as being of value for such practitioners as may desire to determine, without too great difficulty, whether certain cases of deafness will be benefited by treatment or not.

The normal range of hearing is between 16 and 48,000 double vibrations per second. When there is an interference in the conduction apparatus, hearing for lower tones is lessened or lost. When there is an interference in the perception apparatus, hearing for the higher tones is lost. Normal ears hear twice as long by air conduction as by bone conduction. When the conducting apparatus is diseased, bone conduction is longer. When the perceptive apparatus is diseased, bone conduction is diminished and the relative time for air conduction lengthened.

The Rinne test depends upon the comparison of the hearing of the tuning fork by air conduction and by bone conduction. It hearing by air exceeds that by bone conduction in a deaf ear, it is called "Rinne positive," and indicates a nerve deafness; and if hearing by bone conduction exceeds that by air conduction in a deaf ear, it is called "Rinné negative," and indicates middle-ear disease.

The Weber test is made with a C2 512 V. fork, placing it on the median line of the skull, forehead, teeth, or chin. When there is disease or interference of the conduction apparatus, the sound of the tuning fork will be accentuated on the affected side; but if the deafness is due to labyrinthine disease, it will be heard better on the normal side. Often the Weber test will not lateralize.

The Schwabach test depends upon the fact that in middle-ear disease a fork vibrating in contact with the cranial bone is heard longer in the affected than in the normal ear. When the auditory nerve is affected, it is heard longer by the normal ear. The fork is struck and placed on the patient's mastoid; when the sound ceases it is transferred to the examiner's mastoid. If it is then heard, it indicates labyrinthine disease in the patient. If not heard, the examiner first places it on his mastoid, and when the sound ceases, places it on the patient's mastoid. If heard by the patient after the examiner's normal ear has ceased to hear it, an obstruction of sound conduction, but not disease of the auditory nerve, is indicated. Politzer values this test as diagnostic of nerve involvement, and prognostic for recovery under treatment when the sound perception is prolonged through the cranial bones.

A negative Rinné test indicates middle-ear disease which should be partly or entirely benefited by treatment. A positive test indicates nerve deafness, which with a few exceptions implies an unfavourable prognosis. The Schwabach test is based on principles which state that when the conduction apparatus is diseased, bone conduction is lengthened, and when the perception apparatus is diseased, bone conduction is shortened. The Weber test is only valuable in indicating disease of the perception apparatus in unilateral deafness when the sound is accentuated in the normal ear. A study of a short series of cases seems to show that tuning fork tests are of value as aids in prognosis when they point to middle-ear disease; that even with indications of a diseased perception apparatus supported by many tests, care should be taken in giving an unfavourable prognosis until treatment has been administered and found to be useless, and that probably it is wrong to record the Rinné test as positive or negative; but that the records should show the proportions of time thus: Rinné, right, air, $\frac{10}{30}$; left, bone, $\frac{5}{20}$. The numerator tells the number of seconds by which air or bone conduction exceeded the other, and the denominator indicates the total time of hearing for the stroke of the fork.

TREATMENT.—Theobald[10] uses chiefly **Mercuric** solutions of 1-8000, and frequently 1-4000, in the treatment of *otitis media purulenta*, although occasionally **Boracic Acid** in saturated solution is more efficient. When there is profuse discharge, the ear is syringed thoroughly with whatever solution is used, two or three times a day; but if it is scanty, the ear is merely cleansed with a cotton pledget. When the acute stage has passed and it is permissible, the discharge may be sucked out of the tympanic cavity, either by the Valsalva method or by the Politzer bag; then the ear is wiped out, and a quantity of warm solution sufficient to fill the canal is poured into the ear and allowed to remain for ten minutes, after which time the solution is allowed to run out and the ear is dried, but not thoroughly, and a cotton pledget is placed in the meatus. The frequency of these applications depends upon the effects produced, but they are never applied more than once in twenty-four hours. In chronic otorrhœa the bichloride solution seems to be more effective, except when there is extensive destruction of the drum head, in which case boracic acid, or boracic acid with **Aristol** or **Zinc Oxide** in equal parts, is more successful than the mercuric solutions.

Yankauer,[11] in *chronic aural suppuration*, first removes any causative factor in the nose or nasopharynx which may lead to infection of the Eustachian tube. He finds about 60 per cent of his cases of middle-ear suppuration become dry after closure of the Eustachian tube by **Curettement.** Often more than one curettement is necessary to bring this about, and the time of healing of the ear after this varies from a few weeks to eighteen months, the average time being about six months. If after the closure of the tube there is secretion in the tympanic cavity, it is removed by dry wipings under direct inspection by the physician, or by irrigations. If the latter is employed, the ear should be thoroughly dried with absorbent cotton or gauze. To obtain satisfactory drainage from the mastoid cells, it is often necessary to perform an **Intratympanic Operation** which includes ossiculectomy, incision of all adhesions, removal of part of the outer attic wall, breaking down of the processus cochleariformis, and curettage of the Eustachian tube from the isthmus outward. With the subsidence of organic atresia of the Eustachian tube granulations shrink rapidly and polypi have less tendency to recur, the cut adhesion does not unite again, the inner tympanic wall becomes dry, pale, and leathery looking, and the perforation in the drum membrane never becomes smaller but grows larger, so that the only remaining portion of the drum is a narrow white band on the annulus tympanicus.

Coates[12] reports three cases of *spontaneous re-formation of ear drums* that had been almost completely destroyed, and over a long period of years. Once the reparative process began, it continued spontaneously. He thinks that under favourable circumstances even the largest perforations may close years after the inception of the disease, and as soon as it has entirely ceased within the tympanic cavity there is a tendency to regeneration of the tympanum. The reason for so many failures in restoring the continuity of the tympanic membrane lies in the lowered vitality of the tissues. Before beginning active treatment, the general health of the individual should be brought to the best condition possible.

Mastoiditis.—Verel[13] found in 96 out of 125 cases of acute mastoiditis, or 77 per cent, that the temperature was less than 100° F.; of 29 cases in which there was a temperature of 100° or over, an intracranial complication was found in 22, while in 2 others, septicæmia and tuberculosis might have caused the fever. Mastoiditis of itself very rarely gives rise to a temperature of 100° or over, and if fever is present we must suspect an intracranial complication or some general toxic condition.

Bryant,[14] in considering the need of a mastoid operation, is guided by the history, the condition of the ear, the presence of general sepsis or symptoms indicating intracranial complications, formation of an abscess which requires surgical drainage, a skiagram of the mastoid region, and bacteriological examination; the presence of chronic middle-ear suppuration which will not yield to other treatment, or is associated with cholesteatoma, of acute middle-ear suppuration if it has become unreasonably prolonged, or if the skiagram shows an absence of the antral pneumatic cell system, or suppurating labyrinthitis indicates operation. The Röntgen rays clear up a doubtful diagnosis, giving, together with other clinical symptoms, positive indications for or against operation. Prognosis following the mastoid operation performed at the earliest moment is good, with speedy convalescence, absence of complications, and restoration of normal hearing; delay of diagnosis and of operation encourages complications.

Yates[15] discusses the question of the **Radical Mastoid Operation** in *children*, and says that the presence of foul discharge, of cholesteatoma, of polypi or granulations, of displaced ossicles, of fistulæ leading into the attic or back toward the aditus, points to the necessity of a radical operation. Enlarged tonsils and adenoids undoubtedly influence acute inflammation of the middle ear, and frequently help to keep up the discharge, but their removal will not cure an otorrhœa that arises from dead bone. Children under three or four years of age with chronic suppuration may, as a rule, be treated on the expectant plan. Children from five years of age and upward with discharging ears of two or three years' duration, and with growing deafness on the affected side, who have not yielded to persistent local treatment, are submitted to the operation, which does not endanger life, will permit a useful degree of function, and will leave no deformity. This is the thing to choose, rather than to allow suppuration with all its uncertainties and dangers to go on indefinitely. Yates in his technique places special emphasis upon his incision, which begins at a point in the middle meatus of the mastoid tip, is curved sharply backward, and ends at a point above the meatus; it allows the sutured edges to have support at least in part of their extent after operation is completed. The incision is carried through skin, muscle, and periosteum as far upward as the lower border of the temporal muscle, where the skin only is cut through. Where a previous simple mastoid operation has been performed, the scar must be cut through. Elevation should not be attempted until the periosteum is thoroughly incised and the bleeding stopped. This done, elevation of the whole thickness of the flap is easily accomplished without bruising or mauling the tissue—an important factor in the healing. In very young children when the bone is found hard and barren of cells except for a small antrum lined with necrotic membrane and filled with granulations, it is better to perform the Stacke operation and simply clean out the antrum and middle ear, thereby throwing them into one cavity and leaving the greater part of the mastoid cells untouched. In children, the internal tympanic wall and the region of the round and oval windows must not be too zealously curetted. The plastic flap is so made that, when completed, the meatus is about one-third larger than normal; it is round or oval, and not noticeable. In making the flap, the membranous canal is split up to the margin of the concha with a straight, blunt pointed knife, which is then turned at right angles to this incision, and a cut is made curving to the floor of the meatus and thereby allowing the lower flap to drop freely to the bottom of the bony cavity. A similar cut is made upward, starting again at the end of the first incision. Then enough fibrous tissue is dissected away from the skin flaps to fit snugly into the walls of the bony cavity. In case of too abundant tissue, a triangular section is cut out, and the flaps are anchored in position by a single catgut suture. Grafts may be used to cover these parts, or the cavity treated by tamponing with gauze until epithelialization is completed. For cleansing purposes, simple saline solution is preferred.

Welty[16] whose reports of excellent results as to hearing after the radical operation with use of grafts have been referred to in previous volumes of the MEDICAL ANNUAL, records further cases showing improvement in hearing, the duration of treatment being from three to six weeks. He states that all patients under fifty years of age who hear a whisper from a distance of 5 ft. or less, will show improvement in hearing, provided the operation is properly done. Patients who hear the whisper from 10 to 15 ft. may not be improved in hearing. If the labyrinth is intact, and the hearing for the whisper is below 10 ft. there is certainty of improvement.

In order to hasten the rapidity with which the mastoid wound may be closed, various new methods are offered. Iglauer[17] takes a flap from the temporal mastoid. The mastoid cavity being thoroughly excavated, the original mastoid incision is prolonged upwards and forwards into the hairy scalp. The incision, concave and about 1½ in. long, lies immediately anterior to the posterior border of the temporal muscles. The scalp is dissected downward and forward, exposing the temporal fascia, and the posterior portion of the temporal muscle and fascia are next freed from the pericranium. A triangular flap with the apex downward is then formed by splitting off the exposed muscle in the line of its fibres. The pedicle, being formed of the fibres passing under the zygomatic arch, contains branches of the temporal arteries. The flap is then rotated downward and backward into the mastoid cavity. Should the temporal ridge be too prominent, it is chiselled away with the underlying bone in order to provide a groove for the pedicle, which may, if necessary, be lengthened by cutting obliquely across some of its anterior fibres. The flap is fastened to the periosteum by catgut sutures at the lower angle of the incision, to which a rubber drainage tube is passed through the antrum. A puncture is made through the scalp over the dead space left by the removal of the muscle flap, and a gauze wick inserted. The scalp incision is sutured, the upper sutures being tied, and the lower ones left untied for one or two days in order to allow for drainage. The mastoid incision is closed by interrupted sutures. Layers of gauze are placed over the dead space, and a very firm bandage applied.

Ballin,[18] in order to bring about a similar result, has in three cases transplanted a piece of bone with periosteum attached, from the tibia of the patient to the mastoid wound, and then sutured it to the skin. The portion removed is cut to fit the mastoid cavity, which must have good granulations. This is done about ten days after the original operation, and if the case goes well, healing is complete a few days thereafter. The cavity underneath its bone-graft fills with blood-clot, which later organizes into bone. For hard eburnated mastoids the procedure is not indicated. It has so far been used in but three cases. Preservation of the periosteum of the transplanted bone is essential.

Ross[19] reports his experience of the use of **Scarlet Red** as an after-dressing following the radical mastoid operation in order to hasten epithelialization of the wound cavity. The periods varied from twenty to forty-four days, the average being five weeks. The use of the red ointment is best delayed until healthy granulation has been set up by the use of bismuth gauze; it is then applied for periods of forty-eight hours, ribbon gauze saturated with the ointment being the medium. An interval of twenty-four hours is left between each application, when bismuth gauze or eucalyptus vaseline is to be used. A temporary increase of discharge may be expected after the first application or two. The method requires careful supervision to prevent exuberant granulations and the formation of pockets. The contour of the cavity is well maintained, and the epithelium is strong.

Milligan[20] compares various methods of treatment after the radical mastoid operation, such as packing, alcohol drops, antiseptic powders, cell proliferants, skin grafting, and the use of the blood-clots, and finds the best results with the use of the **Blood-clot Dressing**, healing having resulted in an average of just over six weeks in twenty cases. Second in his preference comes application to the granulating surfaces of one or other of the **Cell Proliferants**, namely, scarlet-red, amido-azotoluol, pellidol, azodolen, and allantoin. He advocates closure of the Eustachian tube at its nasopharyngeal end, because closure at its tympanic orifice is dangerous on account of the uncertain proximity of the internal carotid artery. Curettement of the tube destroys the mucous glands of the part, and he considers it essential to retain their presence if the best results so far as hearing is concerned are to be secured. Almost all attempts at effecting permanent closure of the tympanic orifice of the tube are admitted to be failures. The mucosa of the inner tympanic wall should be treated with great respect, and, if not degenerated, should be retained in order to secure the greatest amount of post-operative hearing power.

Fraser[21] reports a case of *erysipelas* following a case of radical mastoid operation, and considers that it follows this operation oftener than is usually supposed. In its early symptoms it is very hard to differentiate from intracranial complications, as the severe headaches, tenderness on pressure, high temperature, and slight stiffness of the neck may be present before the erysipelatous blush appears on the skin.

Cervical Abscess.—De Carli[22] says superficial adenitis is characterized by a small painful tumour of rapid formation. If pus can be squeezed out of the ear on gently pressing the neck, the diagnosis is certain. Deep cervical abscesses, the so-called Bezold's mastoiditis, present difficulties; there is a slow formation of a swelling at the insertion of the sternomastoid which tends to spread downwards and backwards, and limitation of movement of the head. Pus is too deep for fluctuation to be perceived. Left to themselves, cervical abscesses tend to spread to the mediastinum, at first following natural ways, and then breaking these barriers. Treatment should begin at the ear as soon as a presumptive diagnosis can be made.

Meningitis.—Milligan[23] considers the successful treatment of otitic meningitis to be dependent upon early diagnosis and early drainage. Special knowledge is required in order to make an early diagnosis, and courage to operate in the absence of the full *ensemble* of text-book symptoms. The localized form known as extradural abscess is a more common complication of acute than of chronic otitis media, and is more often found in the posterior than in the middle fossa. All cases of purulent meningitis are preceded by a serous stage, when a desperate fight is made by the meninges and cerebrospinal fluid to resist bacterial invasion. Metabolism of the products of bacterial life is such as to destroy or partially destroy the existing carbohydrates or proteins in the cerebrospinal fluid. There is a certain test (Kopetzky) for determining when serous meningitis is becoming purulent. So long as the cerebrospinal fluid remains alkaline, even though turbid, there is reason to expect a good result from operative interference; but should it become turbid and acid the prognosis is grave. Bacteria are not found in films or in cultures in the early stages of the disease. It is at the stage of the disease when the cerebrospinal fluid, although possibly turbid, is still alkaline and capable of reducing the copper in Fehling's solution, that **Lumbar Puncture** is so advantageous as a therapeutic measure. The use of **Urotropin** is said to have a beneficial effect, and to assist in keeping the cerebrospinal fluid aseptic. Its rapid elimination, partly as formaldehyde, and the fact that it is found in the cerebrospinal fluid soon after its administration by the mouth, have given rise to the idea that it might possess a certain antiseptic value. To be successful, any treatment of otitic purulent meningitis presupposes elimination of the primary focus of infection, whether it be a middle- or an internal-ear suppuration, or, as is so frequent, the two combined. The internal ear is not only by far the most frequent avenue of infection to the meninges, but also the most dangerous because it leads to direct infection of the posterior fossa. Milligan has performed Haynes' operation (*See* MEDICAL ANNUAL, 1913, 212) twice, but in neither case did the patient survive. His records show 37 cases of meningitis serosa so-called, with 29 recoveries and 8 fatal cases. In these 8 cases the cerebrospinal fluid became definitely purulent, and although one or other form of decompressive operaton was performed, it was unsuccessful. Of 14 cases diagnosed at the time of admission to hospital to be suffering from purulent meningitis and submitted to operation, 10 died; in 4 of these cases it would have been wiser to attempt no operation, while the remaining 6 had a sporting chance of recovery. Four of the 14 recovered. Milligan summarizes by saying that if he had a case of chronic suppurative middle- or internal-ear disease, with the temperature going up and arterial tension increasing, with diminishing alkalinity of the cerebrospinal fluid and absence of copper reduction on boiling it with Fehling's solution, he would recommend a **Decompression Operation**, because such a case was obviously tending toward purulency, and one was justified in operating at once to prevent it.

Dan McKenzie[24] emphasizes the diagnostic importance of pain occipital headache associated with some rigidity of the neck. In meningitis, one can early elicit rigidity of neck muscles. Occipital headache, whether combined with this or not, should lead to lumbar puncture and examination of the fluid.

Day[25] reports the results of operative treatment in 53 cases of diffuse suppurative otitic meningitis; 4 recovered, 3 after operation, and 1 after vaccine therapy. One of the operation cases died later from a reinfecting meningitis. Seven cases were complicated by sinus thrombosis, 10 by purulent labyrinthitis. In 48 a **Mastoid Operation**, either simple or radical, was performed, supplemented in 33 cases by other procedures directed to the infected meninges; in 10 cases by dural drains; in 8 by simple incision of the cisterna magna; in 1 by drainage of the lateral ventricle; in 1 by lavage of the ventricle; in 4 by intraspinal injection of urotropin solution; in 2 by intraspinal injection of oxycyanide of mercury.

For diagnosis, lumbar puncture gives us the most reliable information as to the condition of the meninges. Slight turbidity cannot be accepted as a positive sign of a diffuse process, for it may result from a very limited area of infection. In serous meningitis a slight turbidity, with a markedly increased number of polynuclear leucocytes in the presence of pyogenic organisms, indicates an extensive involvement and a correspondingly hopeless condition. It has been said that the findings from examination of the spinal fluid might under certain conditions lead to a diagnosis of a condition more serious than that really existing, but Day did not find this to be so. In three cases, the examination of the spinal fluid led to a correct estimation of the gravity of the brain condition. In these, repeated punctures showed a slightly clouded fluid, non-pathogenic bacteria, and leucocytes, but no infective organisms. On post-mortem examination streptococci were obtained in abundance, both by smears and culture from the dural spaces. The bacteriology of the primary aural infection offers no indication for or against operative interference. The organism found in the ear at time of examination will not always be identical with that in the dura. This is especially true in chronic purulent otitis media.

The cases were treated by operation, either alone or in combination with injection of drugs into the spinal canal; vaccines, and sera. The treatment of suppurative meningitis by the administration of drugs has proved useless, with the possible exception of the use of **Urotropin** as a prophylactic. Theoretically, surgery should give relief. Practically, the mortality has not been changed by it. Urotropin was used intraspinally in four cases. Three of these had streptococci in the spinal fluid, and one pneumococci. There was improvement in only one case, a streptococcic. Intraspinal injections of oxycyanide of mercury were used in two cases, but without results, for any benefit derived in the meninges from the drug were offset by inflammation in the bladder and kidneys, acute enough to cause early death. The results of vaccine therapy have been such that it has been discontinued.

Operative procedure in otitic meningitis should aim (1) at prophylaxis, and (2) at radical cure. A prophylactic operation eradicates the primary focus in the middle ear and adjacent bony cavities, thus preventing the spread of infection to the meninges. As a curative measure, when meningitis has actually developed, it is of little use in arresting the inflammation. With no signs of infection beyond the temporal bone, no useless exposure of the dura to possible infection should be considered. As to the use of the **Dural Drain**, it has been concluded that it does not satisfactorily lessen the inflammatory action over the base of the brain or spinal cord, or drain the central lobe of the cerebellum (*Plates XXIX, XXX*). It is effective, but to a limited extent. When used in the circumscribed form of the disease it should and does give good results. The successful cases reported in the literature are probably of this class.

Smith[24] reports upon five fatal cases of meningitis in children, having as their cause a serous suppurative otitis media to which too little attention was paid until meningitis supervened. Suppurative otitic meningitis is practically incurable, and therefore, as a preventive measure of any cerebral complications, the author urges early operative intervention before such complications develop. If the infective process does not extend beyond the dura, a circumscribed serous meningitis results which yields promptly to surgical intervention; but if allowed to spread or become purulent, an encapsulated meningeal or cerebral abscess, or diffuse purulent meningitis, results. Kotz[27] reports three cases of otitic meningitis as healed. Careful study would seem to place them under the class of labyrinthine trouble with certain meningitic symptoms, rather than actual cases of meningitis.

PLATE XXIX.

EFFECTIVE SUBDURAL DRAINAGE IN TEMPORAL AND CEREBELLAR REGIONS

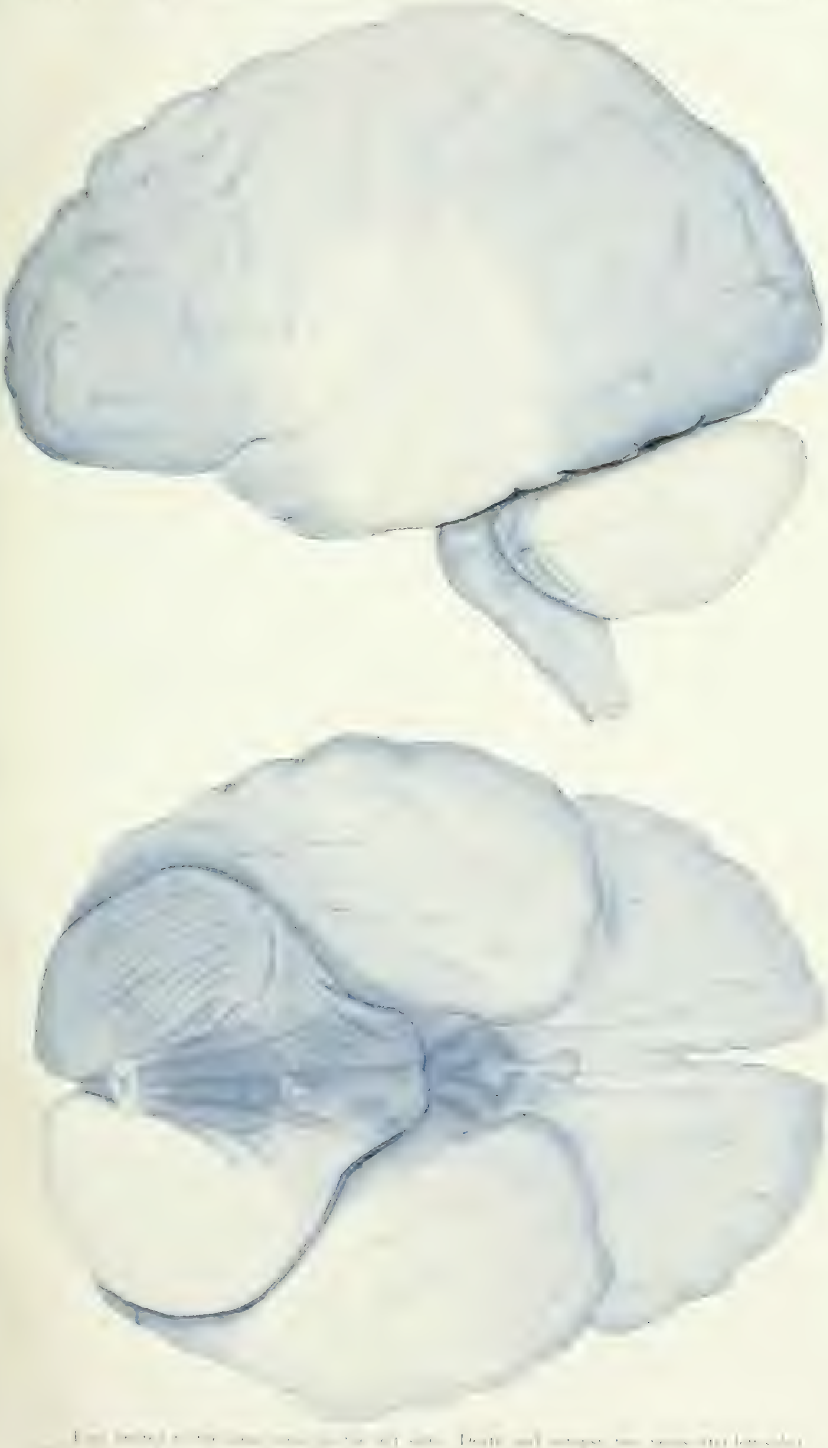

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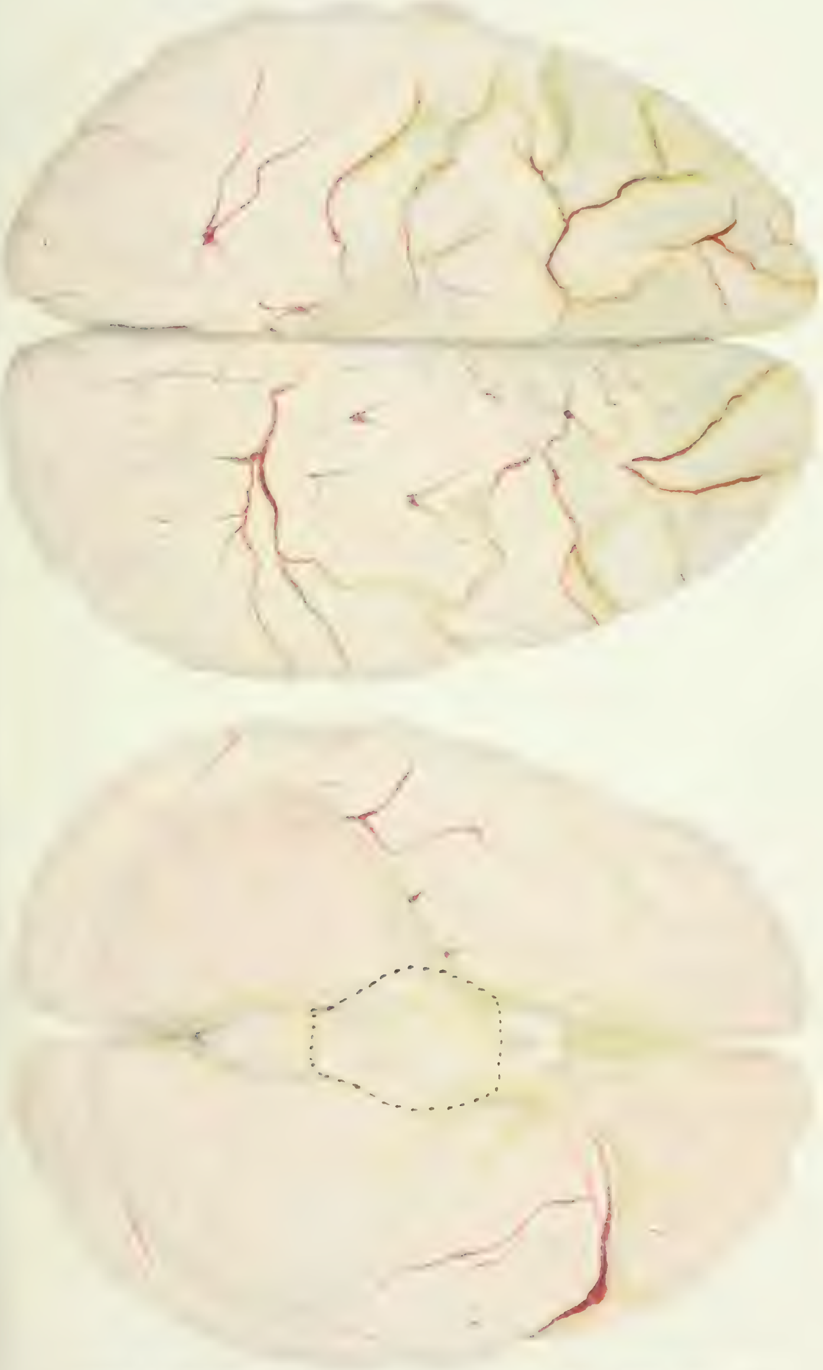
PLATE XXX.

STREPTOCOCCIC MENINGITIS



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Emerson[28] reports a case of temporosphenoidal abscess having some of the signs of a purulent meningitis. The Haynes operation was done, and recovery took place. This can hardly be considered, however, as a pure case of meningitis cured by operation, as the presence of a large cerebral abscess made the diagnosis of a general meningitis somewhat uncertain. Three or four weeks after the operation, slight blocking of the cisterna magna caused hiccough and vomiting. In case of brain abscess it is very important to keep careful watch of the drainage even for weeks after the operation, and the cigarette drain is the ideal method.

Sinus Thrombosis.—Downey[29] considers chills, fluctuating temperature, and sweating as indications of infection of the *lateral sinus.* Other signs may be absent or obscured. The question of operation may have to depend upon the temperature curve alone. The streptococcus is the usual organism. A blood culture is of help in making a diagnosis, but thrombosis may exist without a characteristic blood picture. A marked increase in the leucocytes up to 10,000 or 12,000 per c.mm., with a relative increase in the polymorphonuclear neutrophiles, is of diagnostic value. McCaw[30] does not believe in surgical interference in sinus thrombosis in the absence of clinical symptoms pointing to septic absorption. Frequent blood-counts should be made.

Roy[31] reports a fatal case of bilateral sinus thrombosis resulting from direct infection from the external auditory canal, as determined by autopsy. It occurred at almost identical points on both sides, the pus passing from the emissary veins which empty into the lateral sinus at the masto-occipital suture. Cases of complication arising from furunculosis of the external meatus are rare, and the author urges that they should receive more consideration as a possible source of brain complication.

Crowe[32] offers a mechanical test for the diagnosis of thrombosis of the *sigmoid sinus or jugular bulb.* If the internal jugular vein is compressed with the finger, no appreciable evidence of stasis is seen in the retinal or supraorbital veins; but if both internal jugulars be compressed at the same time, there ensues a marked dilatation of the veins of the fundi and of the anastomotic vessels connecting the intracranial with the extracranial venous circulation. If now the pressure be suddenly released on one side while it is being maintained on the other, the engorged veins of the anastomotic system and of the fundi will empty immediately. Should the results in any individual case differ markedly from those, it must be concluded that there is either an anomaly of the intracranial venous circulation, or some pathological condition which is obstructing the outflow of the blood. During this examination the patient should breathe freely and naturally. The collar should be loosened so as to expose the neck and upper part of the chest. The fundi should be examined by the direct method, or with an electric ophthalmoscope, while an assistant compresses the jugular veins with the tips of the finger. The compression should not be maintained longer than absolutely necessary, for it may be possible in this way to rupture a diseased vein or dislodge a portion of the thrombus (*Plate XXXI*). Among clinical conditions associated with an obstruction to the outflow of blood from the brain, the formation of a thrombus in the sigmoid sinus, secondary to an infection of the middle ear, is by far the most frequent and important. Sinus thrombosis appears with equal frequency as a complication of acute and chronic otitis media, and not infrequently the diagnosis offers great difficulty. Owing to the anatomical position of the jugular bulb in relation to the middle ear, it is possible to have a primary bulb thrombosis with the sigmoid and transverse sinuses normal in appearance; and the condition may not be recognized even at an exploratory operation. One of the cardinal symptoms of sinus thrombosis is a remittent fever with chills, due to the serious nature of the malady. It is desirable to know at an early stage whether the symptoms are due to a sinus thrombosis or to other conditions such as angina, pneumonia, malaria, the initial stage of one of the infectious diseases of children, meningitis, or brain abscess.

Ballance and Hobhouse[13] find thrombosis of the *cavernous sinus* occurring from frontal or sphenoidal sinus infection, from cellulitis of the face, carbuncle of the neck, meningitis, sarcoma of the base of the skull, marasmus, traumatism, and from extension of septic processes from the sigmoid sinus or petrous bone. The cause of the infection of the cavernous sinus must be determined before the appropriate operation can be determined, for the infection is continuous, and should be followed from its origin to its ultimate extension. When the posterior end of the cavernous sinus is infected in temporal bone suppuration, the Hartley-Krause method for exposing the Gasserian ganglion is adopted; but when pus has been evacuated from the sinus, the Voss method of cutting away the zygoma and removing more bone from the basal aspect of the skull to secure direct drainage is used. Operation on the cavernous sinus should be done at an early stage to prevent the infection from reaching the opposite sinus through the circular and transverse sinuses, and meninges. In osteomyelitis of the petrous, the bone is removed piece by piece, irrigation of one or both petrosal sinuses being insufficient. The cutting away of the whole petrous includes exposure, and if necessary, deliberate opening of the petrosal sinuses. It is of advantage to bring the posterior end of the cavernous sinus directly into the field of operation.

REFERENCES.—[1]*Ann. Otol.* 1912, Dec.; [2]*Hosp. and Med.* 1913, June; [3]*Ann. Otol.* 1912, Dec.; [4]*Ibid.* 1913, June; [5]*Bost. Med. and Surg. Jour.* 1913, Feb.; [6]*Med. Rec.* 1913, July; [7]*Jour. Amer. Med. Assoc.* 1913, Sept. 27; [8]*Ann. Otol.* 1913, June; [9]*Med. Rec.* 1913, Jan.; [10]*Ann. Otol.* 1912, Dec.; [11]*Ibid.*; [12]*Laryngoscope*, 1913, June; [13]*Jour. Laryngol.* 1913, May; [14]*Ann. Otol.* 1913, June; [15]*Amer. Jour. Surg.* 1913, Aug.; [16]*Jour. Amer. Med. Assoc.* 1913, Sept.; [17]*Laryngoscope*, 1913, May; [18]*Med. Rec.* 1913, Mar.; [19]*Jour. Laryngol.* 1913, Apr.; [20]*Brit. Med. Jour.* 1913, Sept. 20; [21]*Jour. Laryngol.* 1913, Sept.; [22]*Jour. Laryngol.* 1913, Jan.; [23]*Ibid.* May; [24]*Ibid.*; [25]*Surg. Gyn. and Obst.* 1913, Apr.; [26]*Ann. Otol.* 1912, Dec.; [27]*Münch. med. Woch.* 1912, Dec.; [28]*Jour. Amer. Med. Assoc.* 1913, Sept.; [29]*Ann. Otol.* 1912, Dec.; [30]*Ibid.*; [31]*Ibid.*; [32]*Johns Hop. Hosp. Bull.* 1912, Nov.; [33]*Ann. Otol.* 1912, Dec.

OTOSCLEROSIS.

Geo. L. Richards, M.D.

Lake[1] considers that brilliant results may be obtained from the use of **Radium** in early cases of otosclerosis.

REFERENCE.—[1] *Ann. Otol.* 1912, Dec.

OVARIAN TUMOURS.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

TREATMENT.—Barrett[1] discusses the treatment of *ovarian tumours complicating pregnancy, labour, and the puerperium*, in a review of 114 cases. Seventy-six cases were treated by operation during pregnancy, with only 3 deaths—a mortality just under 4 per cent; while of the 38 cases treated expectantly, 8 maternal deaths resulted—a mortality of 21 per cent. Of the 73 surviving cases treated by operation, 63 went to term; in 1 hysterectomy was done, as pregnancy was not suspected, which leaves only 9 abortions, in spite of the fact that in many cases there was torsion of the pedicle, infection, or incarceration. Of the 38 cases treated expectantly, only 7 escaped operation; 4 of these died, while the 3 remaining still have the tumour to be dealt with. Eight were cases of double ovarian tumour, and out of these 8 double ovariotomies, 6 went to term, this evidence contradicting the opinion that pregnancy cannot continue without the corpus luteum. He quotes a case in which both ovaries were removed with the corpus luteum; this was followed by a normal delivery of a living child at term 260 days after the operation.

He considers that the tumour should be removed as soon as possible after its discovery; this treatment gives a high percentage of good results to mother and child, and avoids the dangers during labour and the puerperium. Induced abortion with its 100 per cent fœtal mortality is unjustifiable, as is also the tapping of a tumour either through the abdominal wall or vagina. Great care should be exercised in manipulations of the uterus during operation, but it shows such toleration that the necessary handling, even to stitching, need not be feared. Owing to the great risk of torsion and degenerations during the puerperium, an ovarian tumour should be removed as soon after labour as the patient's condition and surroundings will allow.

Jones[2] considers that ovarian cysts produce serious trouble sooner or later, especially during pregnancy, labour, and the puerperium, the most dangerous period being the latter. Torsion of the pedicle is the most common accident. Though the multilocular cystadenoma is the most common form of cyst of the ovary, dermoids seem to produce serious trouble proportionately more frequently. In general he thinks that ovarian cysts should be removed as soon as possible after they are discovered; the only exception being for tumours not discovered until after the fifth or sixth month, when the operation should be deferred until the child is viable. He considers that expectant treatment and aspiration of the cyst are unjustifiable. Ovariotomy has a mortality far lower than that of any other treatment.

REFERENCES.—[1] *Surg. Gyn. and Obst.* 1913, i, 28·; [2] *Ibid.* 63.

OZÆNA. *W. G. Porter, M.B., F.R.C.S.*

Etiology.—Hofer[1] has investigated the connection between Perez's bacillus and ozæna. He found the organism in a considerable number of cases, and also, after its injection into guinea-pigs, changes were produced in the nasal cavities comparable to those found in man.

Treatment.—W. Abbotson[2] has treated twenty cases of atrophic rhinitis with **Reniform**, which is an almost odourless substitute for iodoform. It was used as a paint or spray in a 0·5 per cent solution in olive oil or glycerin. The author found it tended to reduce crusting, and mitigated the smell. No ill-effects resulted from its use.

Moure,[3] in reviewing various methods of treatment for ozæna, especially recommends the injection of **Paraffin** into the inferior turbinals with a view to compensate for the atrophy of the parts. Auerbach[4] has treated 32 cases of ozæna by this method. The site of the injection may be the inferior turbinal, the septum, or the floor of the nose. Twenty-six cases were markedly improved; but 6 could not retain the paraffin, and were not affected.

Jacobs[5] has found **Scarlet Red** of value in the treatment of ozæna. He used it in a suspension in mucilage of acacia of 5 per cent strength. The nasal cavities were first cleansed thoroughly with Dobell's solution. The suspension of scarlet red was then rubbed vigorously over the mucous membrane of every part of the nose. The treatment was carried out every second or third day at first, and at longer intervals as the condition improved. After two or three weeks improvement was noted. Of 20 cases treated in this way, all were benefited.

References.—[1]*Wien. klin. Woch.* 1913, 1611; [2]*Med. Press and Circ.* 1913, i, 658; [3]*Berl. klin. Woch.* 1913, 801; [4]*N.Y. Med. Jour.* 1913, ii, 900; [5]*Ibid.* i, 1141.

PANCREAS, FUNCTIONAL ACTIVITY OF. *Oskar C. Gruner, M.D.*

The study of pancreatic ferments by a special method of obtaining duodenal contents has provided a considerable fund of information valuable for application to clinical diagnosis. It has seemed more rational to examine the contents by this direct method than to rely upon the finding of glycosuria or the appearance of fat or even pancreatic ferments in the stools. The subject has received careful consideration at the hands of Crohn,[1] who uses the Einhorn duodenal pump for obtaining the secretions, and follows a definite ritual. The patient swallows the capsule at the end of a rubber catheter at 8 p.m., aided by a little water. At midnight he drinks eight ounces of milk, in order to allow the capsule to pass the pylorus. At 6.30 a.m. he drinks eight more ounces of milk, and at 9 a.m. the catheter is slightly withdrawn up to the 80-cm. mark, and is allowed to stand there for five minutes, after which the contents of the bucket are aspirated. They should be golden yellow, slightly acid or neutral, rather viscid with a more or less opalescent hue. The apparatus is now withdrawn into the stomach, and the contents are aspirated.

Procedure of Analysis.—To the contents of the first part an equal quantity of distilled water is added. This is divided into two portions. *A* and *B*. Portion *A* is kept acid and on ice for five hours; then tested for *amylase* and *lipase*. Portion *B* is alkalinized with decinormal soda and put on ice for five hours; then tested for *protease*.

Test for Amylase.—To successive c.c. add ·5, 1, 2, 3, 4, 5, and 6 c.c. of 1 per cent starch solution, making all up to 10 c.c. with water. Incubate them one hour, and the number of c.c. of starch in the last tube that fails to react with iodine multiplied by 3, indicates the amylolytic power of 1 c.c. of duodenal contents in an hour, the normal being 2.

Test for Lipase.—1 c.c. juice, with 10 c.c. water, 1 c.c. ethyl butyrate, 1 c.c. toluol, and 1 drop of 1 per cent phenolphthalein are neutralized with decinormal soda and made up to 25 c.c. with water, shaken for fifteen seconds, and neutralized again. A boiled juice should be used as the control. Incubate for twenty-four hours, titrate for free acid. The amount of free acid in the test flask, less the free acid necessary to bring the control to neutral, multiplied by 3, indicates the lipolytic strength. The normal is equivalent to 1 to 3 c.c. of decinormal soda.

Test for Protease.—Use Mett's tubes—capillary tubes containing egg white, and dipped in boiling water to coagulate the contents,—or cubes of egg white; these are placed in the fluid to be tested. Evidence of ferment action in a suitably acid medium lies in the partial solution of the cubes or of the contents of the tube.

The amount of the ferments varies from day to day. The points to note are occasional absence of lipase or amylase. The value of the study lies in the determination of patency or otherwise of the ducts.

REFERENCE.—[1] *Amer. Jour. Med. Sci.*, 1913, i, 393.

PANCREAS, LABORATORY DIAGNOSIS OF DISEASES OF. (*See also* FÆCES, EXAMINATION OF.)

O. C. Gruner, M.D.

1. The detection of diastatic ferment in the urine is of value in estimating the presence of interstitial pancreatitis. (*See also* URINE TESTS.)

2. Estimation of diastase in the fæces. Rotky[1] made a study of this subject, using Wohlgemuth's method. The material was dried and powdered, and the total nitrogen estimated before and after dialysis. The unit employed was the number of c.c. of ·5 per cent starch solution that were hydrolyzed by one gram of powder. If there were much less than 100 units, it seemed likely that one could assume impairment of pancreatic function.

From the results obtained by this author, the following table may be drawn up, in order to show at a glance the results of analysis of duodenal contents that are to be expected in different states:—

Condition of Subject	Amylase	Lipase	Trypsin
Normal pancreas	+	+	+
Degeneration of pancreas	0	trace	+
Obstruction of pancreatic duct	0 (not constant)	trace (temporary)	+
Acute pancreatitis ..	diminished	diminished	+ (not constant)
Pancreatic anomaly .	0	0	+
Cancer of stomach	+	+	0
Achylia gastrica	+	+	no ferments (+ in gastric juice)
Gall stones . .	+ or + +	+	+
Diabetes	+	+	+

Reference.—¹*Munch. med. Woch.* 1913, 2155.

PANCREAS, SURGERY OF.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

Bittorf¹ reports two cases of *abscess of the lesser sac following pancreatitis* in elderly men who had suffered from abdominal symptoms. He describes the signs under the following headings: (1) *General*. There is marked wasting, slight fever, and moderate leucocytosis. (2) *Local*. A circumscribed tender tumour is found in the epigastrium chiefly to the left of the mid-line; it is dull on percussion, but may be crossed by the resonant stomach, and is separated from the liver by a band of resonance. In one of his cases, the abscess contained gas and was resonant. (3) *Pressure signs*. There may be compression of stomach or duodenum; jaundice from compression of the common bile-duct; ascites or œdema of the lower extremities from pressure on the portal vein or inferior vena cava. (4) *Pancreatic*. Such are severe attacks of pain in the epigastrium; evidences of pancreatic insufficiency are less common.

An *accessory pancreas* is a small nodule, sometimes as large as a filbert, situated somewhere in the wall of the alimentary canal. It is most often found in the wall of the stomach, in the wall of the duodenum but detached from the true pancreas, in the first 18 inches of the jejunum (its most common location), or in the lower jejunum or ileum. Histologically it shows typical pancreatic structure and well-defined ducts. According to Carwardine and Short² it may give trouble in four ways: (1) It may produce mechanical alterations in the walls of the alimentary canal (e.g., ring round the duodenum or traction diverticula). In no recorded case do these alterations appear to have caused symptoms. (2) It is liable to acute pancreatitis, the sole recorded instance of this being Short's case. (3) It may develop chronic interstitial pancreatitis. (4) It may complicate the diagnosis of the cause of abdominal symptoms.

The first of Carwardine and Short's cases was a girl of 12 who had been ill four days with vomiting, diarrhœa, and the passage of blood from the rectum. The abdomen was not distended or rigid. There was a little pain and tenderness in the upper abdomen; pulse 80; temperature subnormal. After opening the abdomen, the first 6 in. of the jejunum were bright scarlet in colour, with greatly thickened walls. The mesenteric vessels were not blocked. About 1½ in. from the duodeno-jejunal flexure, in the wall of the jejunum, was a white nodule projecting slightly under the serous coat. There was no peritonitis, fat necrosis, or lymph clot. This little tumour was excised and the opening in the bowel sutured. As this obstructed the lumen, a gastro-enterostomy was done. Death occurred about fifty hours later. The excised nodule proved to be an accessory pancreas in a state of acute inflammation. In the second case, a nodule was excised from the jejunum (*Fig.* 43) during the course of gastro-enterostomy, which consisted of pancreatic tissue but was apparently not causing symptoms.

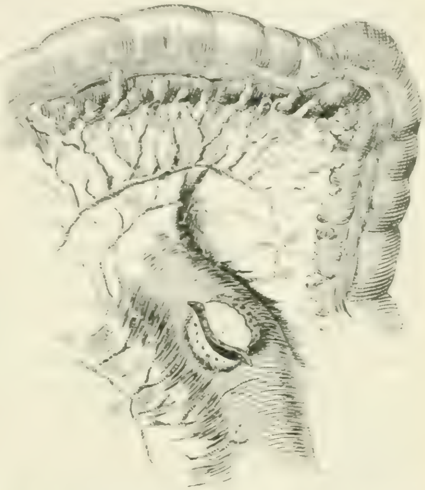

Fig. 43.—Accessory pancreas in the jejunum excised during operation of posterior gastro-jejunostomy (represented as bisected into the bowel).

References.—[1]*Mitth. a. d. Grenzgeb. d. Med. u. Chir.* 1913, 109; [2]*Ann. Surg.* 1913, i, 653.

PANCREATITIS, ACUTE.

Robert Hutchison, M.D., F.R.C.P.

Diagnosis.—In distinguishing cases of acute pancreatitis from acute intestinal obstruction, Todd[1] attaches great importance to the presence of *absolute dullness in both flanks*, unaltered by any change of position, which occurs in acute pancreatitis only. It is due to the presence of coagulated and partially digested blood in the kidney pouches.

Nagy,[2] from the study of a case verified by operation, concludes that in acute pancreatitis there is no change from normal in the relative percentage of the nitrogenous constituents of the urine. Investigation of the tryptic and amylolytic ferments does not yield trustworthy results. On the other hand, he is able to confirm the fact that disturbance of pancreatic function may safely be inferred when fat-splitting falls below 70 per cent.

References.—[1]*Austral. Med. Gaz.* 1913, 279; [2]*Wien. klin. Woch.* 1913, 327.

PARALYSIS, GENERAL.

(*See* Syphilis, Cerebrospinal.)

PARATYPHOID FEVER.

E. W. Goodall, M.D.

An interesting account of 12 cases of this disease (due to infection with *B. paratyphosus B*) has been recorded by James Watt.[1] They were found in an epidemic of 112 typhoid cases in Aberdeen in the autumn of 1912. Probably they would have been set down as typhoid, had it not been for careful study of the serum reactions. In two cases the paratyphoid fever was followed by an attack of typhoid. The writer suggests that they received the latter infection in the hospital, where they were being treated along with typhoid cases. Similar cases have been observed by Scott,[2] in Jamaica. Possibly systematic examination of all typhoid cases would show that some of the "relapses" were not really relapses, but attacks of typhoid following upon paratyphoid. Ten of the 12 cases showed the first signs of illness between the dates Oct. 11 and Nov. 11, 1912; 7 of them lived in the same quarter of the town, and 8 obtained their milk from a common source. Most of the typhoid cases showed their first signs of illness between Sept. 22 and Oct. 11. The facts point to an epidemic of paratyphoid separate from that of typhoid, or to an epidemic of the one within that of the other. The symptoms in these 12 cases were like those seen in mild or moderate attacks of typhoid.

Three cases of the same disease have been described by John Hay,[3] of Liverpool. "Clinically they differed considerably. The first began as an ordinary acute food poisoning. There was temporary recovery, and then a serious and fatal relapse, characterized by symptoms differing markedly from those of the initial illness. The second presented some of the features of enteric fever, but the clinical evidence was not sufficient to justify a positive diagnosis. The third began suddenly with symptoms very characteristic of influenza. There was a transient recovery, followed by a tedious febrile illness." Hay's second case was fatal as well as the first, and from the account given of the serum reactions it appears to have been a mixed infection. The third case was interesting because a rash appeared, consisting at first of rosy-red papules, which later became almost confluent over the scapula, sacrum, and buttocks. Large raised scarlet papules appeared also over the backs of the wrists and hands.

An exhaustive account of the etiology and epidemiology of *B. paratyphosus B* has been published by Job,[4] with a very complete bibliography.

REFERENCES.—[1]*Lancet*, 1913, ii, 1360; [2]*Pract.* 1913, ii, 589; [3]*Med. Press and Circ.* 1913, i, 404; [4]*Rev. de Méd.* 1913, i, 181.

PAROTITIS.

(*See also* MUMPS.) *Frederick Langmead, M.D., F.R.C.P.*

M. H. Gordon[1] describes four cases of fatal disease, of which the chief manifestation was acute interstitial parotitis. All the patients were children, between two and nine, admitted to hospital during May and June, 1913. One child died within twenty-four hours of the onset; this was clinically a case of "convulsions." The others died on the second, third, and fifth day respectively. Three out of the four patients were drowsy at the onset of the disease. All developed coma. One was delirious. The eyes were sunken, and fixed or staring in every case, but neither squint nor any fundal changes were remarked. Muscular rigidity occurred in all, and in two the head was retracted. Kernig's sign was present in three. Three of the patients had twitching, and two had attacks of more or less general muscular rigidity, in the course of which they died. The plantar response was extensor in two, while three lost their knee-jerks and abdominal reflexes. Pallor was marked, and pyrexia, vomiting, and diarrhœa occurred in all. The cerebrospinal fluid was under considerable pressure, and showed an increase of cells, lymphocytes predominating. In one a leucocytosis of 28,000 occurred in the blood, a differential count showing definite lymphocytosis. Post mortem there was a slight degree of meningomyelitis, and foci of acute interstitial inflammation of the salivary glands were found in all four cases, though there had been no obvious parotitis clinically. No bacteria were grown from the heart's blood or cerebrospinal fluid. Since poliomyelitis is known to be associated with an acute inflammation of the salivary glands of a similar form, it may fairly be argued that these were cases of a rapidly fatal form of that disease. Gordon holds the contrary view, however, because no paralysis of a group of muscles was noted during life, and the microscopical lesions of the cord most characteristic of poliomyelitis were not found after death. He regards these cases rather as the result of the unusual action of the virus of mumps, from which disease none of the patients had previously suffered, but suggests also that they may be examples of a new pathological and clinical entity.

REFERENCE.—[1]*Lancet*, 1913, ii, 275.

PEDICULOSIS CAPITIS.

E. Graham Little, M.D., F.R.C.P.

Whitfield[1] gives the following directions for the destruction of pediculi capitis in children over five. It is especially useful in females who object to cutting the hair :—

" The patient is laid on her back on the bed with the head over the edge, and beneath the head is placed a basin on a chair so that the hair lies in the basin. A solution of 1–40 carbolic acid is then poured over the hair into the basin and sluiced backwards and forwards until the whole of the hair is thoroughly soaked with it. It is especially necessary that care should be taken to secure thorough saturation of the hair over the ears and at the nape of the neck, since these parts are not only the sites of predilection of the parasites, but they are apt to escape the solution. This sluicing shall be carried out for ten minutes by the clock. At the end of the ten minutes the hair is lifted from the basin and allowed to drain, but is not dried or even very thoroughly wrung out. The whole head is then swathed with a thick towel, or better, a large piece of common house-flannel, which is fastened up to form a sort of turban, and the head is allowed to remain like this for an hour. It can then be either washed or simply allowed to dry, as the carbolic, being volatile quickly disperses. At the end of this period every pediculus and, what is more important, every ovum is dead, and although the ova are left on the hair they will not hatch, and no relapse will take place unless exposure to fresh contagion occurs. Incidentally any impetiginous scabs are softened, so that they come away easily and allow any ointment which is used for the cure of this complication to be applied easily. In cases where there is no impetigo no further treatment is necessary." [*See also* SKIN, GENERAL THERAPEUTICS OF.]

REFERENCE.—[1]*Lancet*, 1912, ii, 1648.

PELLAGRA.

Leonard Rogers, M.D., F.R.C.P.

In view of the discovery of a number of cases of pellagra in Great Britain during the past year, a brief general account of the disease is likely to be of considerable interest to our readers. The following description is mainly based on Roberts's recent work on pellagra and the article in the last edition of Castellani and Chalmers' "Tropical Medicine," together with recent papers on the disease.

DEFINITION.—Roberts defines pellagra as an endemic and epidemic disease, periodic and progressive in its course, and characterized by a series of symptoms involving chiefly the digestive, cutaneous, and nervous systems.

HISTORY AND DISTRIBUTION.—Casal wrote the first full description of the disease as seen in North Spain in 1735 (although his work was not published until 1762), calling it *mal de la rosa*, and the affection is prevalent in Asturias to the present day. In the same century the disease was well known in Italy, where it is still very common; and in the latter part of the nineteenth century Lombroso closely studied it, and strongly supported the view that it was produced by mouldy maize. Portugal, France, Austro-Hungary, and Roumania have all reported numerous cases, while as long ago as 1866 it was recorded by Brown; and again in 1909 by Cranston Low in Scotland, where several cases were found by Sambon and Chalmers in 1912. Egypt has been known to be infected since 1847, and Sandwith has closely studied it there. In America Gray and Taylor reported definite cases as early as 1864; but it was not until 1907 that the disease was generally recognized in the United States, since which time it has been found to be widely prevalent, especially in the Southern States, and to be an important cause of death as well as of insanity. Much valuable work has been done in the United States during the last few years, as recorded in the epitome of literature in this and previous numbers of the MEDICAL ANNUAL. In 1910 Sambon studied pellagra in Italy; he collected much evidence against the maize theory of causation, and suggested that it might be due to a protozoal parasite, and carried by the bites of sand-flies. Recent work in America is against the sand-fly, and more in favour of the stable-fly (*Stomoxys calcitrans*) as the infective agent.

CLINICAL DESCRIPTION.—A characteristic feature of the disease is its first appearance in the spring or summer months, and retrogression in the following winter, only to recur once more the following warm season, and in chronic cases it may thus continue for many years. On the other hand, the disease may run an acute and fatal typhoid-like course of only six weeks' duration, and every intermediate degree of severity is met with. The onset is insidious, its attack is periodic, and its course progressive (Roberts.)

Skin Lesions.—These are of the greatest importance, especially from the diagnostic point of view. They commence in the form of an erythematous red sunburnt appearance appearing on exposed parts, especially on the dorsal surfaces of the hands, wrists, and forearms, and on the face. Later the condition becomes one of dry eczema, and pigmentation ultimately results. The back and sides of the neck, the dorsum of the feet, and the front of the chest may also become involved. The patches are at first clearly delineated by a raised line. There may be some burning sensation, but no pain as a rule. Later the affected parts become swollen and tense, and even bullæ may form. After some weeks the eruption gradually subsides, leaving a rough, pigmented thickening of the skin. In chronic cases of several years' duration the skin may become atrophied and wrinkled. The skin over the knees and olecranon processes may become much thickened, which condition Roberts calls " dermatogra."

Digestive Symptoms.—These include stomatitis, œsophageal burning, pyrosis, gastralgia, belching, nausea, gastritis, enteritis, dyspepsia ; diarrhœa is usual and constipation rare (Roberts). The tongue is at first coated, but later becomes clean and smooth, red, swollen, and sometimes ulcerated at the tip, as described by Sandwith. The gums may be swollen and bleed readily. The dyspeptic symptoms vary very much, diarrhœa and even dysentery being the most characteristic, and when these symptoms recur every spring they are of great significance. In such cases, if no rash is present, Caszellani advises placing the patient in the sun to see if a rash will develop.

Nervous Symptoms.—The third system to be involved is the nervous, beginning with vertigo, irritability, and tremblings, and going on to melancholia, dementia, and complete lunacy, many cases having recently been found in asylums, the original cause of whose disorder had not been suspected. These frequently terminate fatally. Important degenerative changes in the brain and cord have been described by American workers and by Mott in England, constituting the most important pathological lesions found after death.

Incidence and Predisposing Causes.—The female sex is much more affected than the male, but this is limited to early and mid-adult life, for in children and old people there is little difference between the two sexes. The disease is not inherited, but the incubation period is probably short, and cases have been recorded in young infants. Any age may be affected, but the great majority, especially of females, are between twenty and forty, and the age does not influence the prognosis. Occupation does not appear to affect the incidence, except in so far as living in the country and home work predispose to the disease.

ETIOLOGY.—The cause of the disease is still unknown. The Italian writers more especially have for long held the disease to be due to eating maize, but they differed among themselves as to how this cereal brought it about. Some held that it was due to living too exclusively on a diet composed of maize, much in the same way that polished rice causes beri-beri. Others maintained that it was only mouldy maize which caused pellagra, either through some fungus or bacterium in it, or through toxic products resulting from fermentative action. Recent work by Sambon in Italy and Great Britain, and by American workers, has thrown great doubt upon these ideas. The second theory is that the disease is due to some unknown organism, which is transmitted by the bites of insect carriers. Sambon has suggested that the organism may be protozoal, and he suspects the sandfly to be the carrier, but modern American work is not in favour of that insect, the distribution and habits of which will not account for the incidence of the disease in the Southern United States. (*See* abstract of literature, *infra*). Recent observations tend to show that the organism may be ultra-microscopic, and that monkeys may be infected by injecting extracts of the fresh tissues of patients who have died of pellagra. If these experiments are confirmed, they will go far towards proving the parasitic theory of the disease. An important Commission is working steadily in the affected parts of the United States, and further light may shortly be expected on the subject.

TREATMENT.—The first thing to do is to remove the patient from the infective area. A nourishing **Diet** should be given, but there is some difference of opinion as to whether maize should be forbidden. In our present state of knowledge it would appear to be safer to do so. Any complication, such as hook-worm disease, should be excluded. There is no specific drug for pellagra, but there is a consensus of opinion that **Arsenic** is the most valuable form of treatment. It should be given in full doses of **Fowler's Solution,** supplemented by injections of **Soamin** or other such preparation. Roberts advises hypodermic injections of **Cacodylate of Soda,** beginning with 3 gr. every three days, gradually increased up to 5 gr. every two days. **Salvarsan** has been warmly advocated by T. H. Martin and other American workers. (*See* abstracts of literature.) Sandwith in Egypt found fresh **Bone-marrow** tabloids of service. In severe cases Cole has used **Transfusions of Blood** with remarkable results as reported in the MEDICAL ANNUAL for 1913. Other treatment is of a symptomatic character. **Dilute Hydrochloric Acid** and **Bitter Tonics** are required to aid the weak digestive powers; the occasional diarrhœa or dysentery requires appropriate treatment; the affected parts of the skin should be protected from the sun by suitable **Clothing,** and **Soothing Ointments** applied to inflamed areas.

PROGNOSIS.—This is very uncertain, being bad in the acute typhoid cases, but favourable in early mild attacks in which the patient can be removed from the pellagrous area. It is impossible to say if the disease will recur in the following summer or not. The recurrence of nervous symptoms is of serious significance, and when they are well marked the prognosis is very grave. A steady gain in weight is the most favourable sign, and much can be done by perseverance with arsenical treatment.

ABSTRACT OF RECENT LITERATURE. Siler and Garrison[1] report on the Thompson-McFadden Pellagra Commission They have made an intensive study of the epidemiology of the disease in Spartanburg County, South Carolina, and record many interesting data. The area is at an elevation of 700 feet, and is traversed by a network of streams. Cotton mills support 35 per cent of the white population. Pellagra affects 35 per thousand of the inhabitants, being markedly in excess among the mill villages, but density of population alone will not explain its distribution. It is proportionally five times as frequent in the white as in the negro population. The *sex* distribution shows three times as great a prevalence among females as among males, but this excess occurs almost entirely between the ages of twenty and forty-four, as under ten and over forty-five the disease is equally prevalent among both sexes. The mortality statistics show a similar curve. The *occupation* also furnishes points of interest and importance regarding the relative prevalence among field labourers, cotton-mill workers, and those engaged in housework, as obtained from an analysis of 234 cases. Thus 47 per cent gave housework as their exclusive occupation, and 6 per cent more as their chief employment, while 7·7 per cent worked partly at home and the remainder of the time in the mills. Further, of 97 females living in mill villages, nearly half did no mill work, but housework only. The high incidence among adult females is due to the great prevalence among household workers. The disease was nearly seven times as prevalent in mill villages as in rural districts ; this excess was, however, not found among the mill-workers, but among the women and children engaged during the day about the houses. The family distribution showed an average of only 1·42 cases of pellagra per family, while about half the total cases occurred singly in families, and about one-fourth more were found two in a family. Of the total number of families with pellagra, three-fourths had but one case.

In the second part of their paper,[2] the same writers deal first with the prevalence and mortality in recent years. Between 1894 to 1910 114 cases were traced, since which the numbers have rapidly increased to 376 in 1912, but the death-rate has fallen from 28 in 1910 to 12 in 1912. Elaborate figures are given illustrating recurrences of the disease. A late spring and summer retarded the recrudescence in 1912. A large proportion of the cases were very chronic, and the disease has gradually become milder. In 83 per cent of the patients the economic conditions were poor, and in 17 good. Children not infrequently contracted pellagra during convalescence from some infectious disease. No connection was traced between the disease and overcrowding and bad ventilation, the low incidence among negroes being noteworthy in this connection. Equally unimportant was the water supply, nor did the methods of disposal of excreta, which were for the most part primitive—the sanitary index being only 16 out of 100 for perfection—influence the distribution of the disease. Moreover, in 92 per cent of the cases the dwelling houses were located on well-drained sites. The *diet* was carefully investigated. Corn-meal is the staple food, and formed the daily or habitual diet of 84 per cent of the rural and 72 per cent of the urban and mill-village cases. The average diet of the poorer classes was much superior in variety and nutritive value to that of the peasants of North Italy. Comparative studies of the diet of the non-pellagrous population are not yet completed. The fact that two pellagrous children had eaten no corn meal for two years before being attacked, while several other patients had eaten very little, is against this food being the cause of the disease.

The way in which a widespread disease can be overlooked until attention is prominently drawn to it is remarkably exemplified by the history of pellagra in America. It was only in 1909 that the disease was first recognized in the State of Illinois; yet a recent Commission found no less than 500 cases there, while many more must exist. O. S. Ormsby[3] records an interesting account of their investigations. A good clinical description of the cutaneous, alimentary, and nervous symptoms is given. The influence of sunlight in determining the localization of the skin lesions was demonstrated by the use of fenestrated gloves by suspected patients, when the eruption was largely limited to the exposed parts. Diffuse light without actual exposure to the sun may be effective. Denuded and superficially ulcerated tongue, and diarrhœa, especially severe in fatal cases, were present in a very large proportion of the cases, together with mucus and putrefactive changes in the stools. The skin lesions presented an angioneurotic process, apparently due to an irritant toxin. The change in the central nervous system was a central neuritis without any infiltration of perivascular sheaths. The liver also showed fatty degeneration due to toxins. The blood showed a reduction in the polynuclear and large mononuclear leucocytes and an increase of the lymphocytes, but no organisms microscopically or on culture. The complement fixation test gave doubtful results. In one cottage 50 healthy people were fed on a diet in which corn predominated, for a year, and in another house 58 received no corn, but a nearly equal number of cases of pellagra occurred in each, while many feeding experiments on animals also gave negative results. Fungi and bacteria from corn failed to infect animals. Entamœbæ were commonly found in the loose stools, but do not appear to be a cause of the disease. Analyses of the diets of various institutions showed no marked deficiencies. An entomologist investigated the simulia, but little support was obtained for that theory, the *Simulium reptans*, which Sambon incriminates, being absent from North America except in Greenland; and they point out that Sambon formulated his hypothesis and named the carrier before entering on his investigations. The Commission concluded that pellagra is probably due to some unknown micro-organism.

E. H. Cohoon and F. J. Farnell[1] record a careful study of 17 cases in Rhode Island institutions. There was commonly evidence of peripheral polyneuritis, often with loss of knee-jerks, and the small mononuclear leucocytes were increased. The spinal fluid obtained by lumbar puncture showed a few lymphocytes, indicating a chronic inflammatory process, while a central neuritis is a marked feature.

A. H. Jennings and W. V. King[5] have made an intensive study of *insects* as a possible etiological factor in pellagra in conjunction with the Thompson-McFadden Commission. They lay stress on the disease being rural and affecting household workers especially. *Ticks* they found to be very rare, and since they more frequently attack men, they are excluded by the far greater prevalence of pellagra in women. *Lice* were so rarely met with as to be quite inadequate as carriers of the disease. The *bed bug* was of nearly universal occurrence, and would not explain the sex incidence. Cockroaches rarely attack man; *tabanidæ*, including horse-flies, were also rare. *Fleas* were carefully studied, but as far as attacks on man are concerned were found to be almost of negligible importance, especially in the districts most affected by pellagra. *Culicidæ* were comparatively few in the Spartanburg country as compared with other areas showing few or no cases of pellagra, nor will mosquito infection explain the preponderance of the disease among females. *Simulidæ*, which Sambon suggested might be the carriers of pellagra in Italy, have been carefully studied, and are numerous in the many streams of the district, usually within about two hundred yards of the houses, both those with and those without pellagra cases. They were found to be essentially wild in their habits and rarely bite man, while their life is short, and it is very unlikely that they would often bite a second human being at a sufficient interval to allow of the development of a parasite within them and its transmission through their bites. Even when these gnats were breeding in villages, they showed not the slightest disposition to seek out and attack man or to come about his dwellings. Moreover, the Commission have information that pellagra occurs in Barbadoes, although no species of simulium has been found in the island, the physical characters of which entirely preclude the existence of the fly there. They conclude that, apart from Sambon's theory, these flies could hardly have attracted any suspicion of connection with pellagra in the United States. On the other hand, *Stomoxys calcitrans*, the biting stable-fly, appears to be the most likely carrier. Although it feeds by preference on animals, yet man is very frequently attacked by it; though most abundant in rural areas, it is usually common in towns and cities, as it breeds in stable manure; it wanders far from its breeding-grounds, and may be dispersed by trains and steamers; it utilizes several hosts for a single meal; it frequently visits human dwellings, and has a preference for living rooms; while, lastly, it bites during the day, and so accounts satisfactorily for the excessive infection of women engaged in household work.

S. R. Roberts[6] discusses the analogies between pellagra and other mosquito-borne diseases, and thinks these insects are probably the carriers of the infection.

W. H. Harris[7] records and illustrates the production of pellagra-like skin lesions on the face and hands of monkeys by a Berkefeld filtrate of extracts of human tissues of cases recently dead of pellagra, and supports the parasitic view of the origin of the disease.

Cases of Pellagra in Great Britain.—L. W. Sambon and A. J. Chalmers[8] discuss the prevalence of pellagra in the British Isles, and refer to cases which they consider to be this disease in medical literature back to 1800. The writers have visited the eastern districts of Scotland in search of the disease, and maintain that pellagra is certainly endemic in Fifeshire, Forfarshire, Aberdeenshire, and the Shetland Isles. Two cases seen in Scotland are described. Charles R. Box[9] has recorded two fatal cases of pellagra in English boys. One of these was under his care at St. Thomas's Hospital, and ran an acute course, and the other was ill for several years, but the true nature of the disease was not recognized at the time. Both came from Slough, in Middlesex. Maize could not have been the cause.

F. W. Mott[10] describes in detail and illustrates the histological changes found in the nervous system in Box's fatal case, as well as those found in an Egyptian case. There was an entire absence of any evidence of meningeal or perivascular infiltration with lymphocytes or plasma cells, or with polynuclear leucocytes, such as is so characteristic of protozoal disease. This is against the protozoal theory of the origin of pellagra, although it does not disprove it. Slight degeneration of a few fibres of the sciatic nerves and cauda equina was found. The spinal cord showed slight diffuse sclerosis, affecting especially the direct and crossed pyramidal tracts, Gowers' tracts, and Goll's column. In the central nervous system, degenerative changes were met with in the posterior spinal ganglion cells, anterior horn cells, in those of Clarke's column, the Purkinje cells of the cerebellum, and in the pyramidal and Betz cells of the cortex. The changes were similar in the English and Egyptian cases.

L. W. Sambon[11] records two further cases of pellagra met with in England, one at Slough, and one at Lymington in the New Forest, where he found two varieties of *Simulium*. He also further discusses the incidence of the disease in Italy. He found that, contrary to experience elsewhere, on the island of Burano, near Venice, the disease is only met with in adult male fishermen, who work along the mainland coast where swarms of small biting flies occur. Both the infected and uninfected classes eat the same maize. He sees no reason for incriminating either the stable-fly (*Stomoxys calcitrans*) or mosquitoes, as suggested by workers in the United States. In a further paper,[12] Sambon reports three more cases in Great Britain, in Cardiganshire, Shropshire, and Napsbury Asylum respectively, and in a yet later paper records several more.[13] G. S. Blandy[14] records in detail the Napsbury case, and also reports two more seen by him in the Prestwich Asylum, Manchester. J. W. E. Cole[15] also records one in the Bethnall

House Asylum. It is already quite clear that the disease is widely prevalent in England, and has for long been overlooked, just as it was in the United States. Further inquiries into its exact prevalence will be awaited with interest.

H. P. Mills[16] has specially studied the pathology of the gastro-intestinal tract in pellagra, and found a chronic catarrhal inflammation, sometimes amounting to a hæmorrhagic colitis. He thinks this is secondary, and produced by toxic products of unknown origin.

H. Raubitschek[17] records numerous unsuccessful attempts to cultivate organisms from the blood of pellagra patients, while serological methods proved useless in diagnosing the disease.

R. M. Grimm[18] discusses the etiology of pellagra in 323 cases seen by him during two years in the United States. The disease was most prevalent among whites and in the female sex, and between twenty and forty years of age. Most cases had their onset in the months of May and June, and among the poorer classes and in the vicinity of former cases, but heredity did not play any part in its causation. He also came to the conclusion that the food acted as a contributory and probably as an exciting cause.

Victor C. Myers and Morris S. Fine[19] report on the metabolism in pellagra. They found foodstuffs to be well utilized, but a lowered physiological efficiency and anacidity. There was marked indicanuria and excess of indol and skatol, and a high elimination of ethereal sulphates, pointing to bacterial putrefaction high up in the intestine.

W. J. Macneal[20] deals with the intestinal bacteria met with in pellagra, and found the flora departed considerably from the normal. In acute cases with diarrhœa, the Gram-positive cocci were more, and the gram negative bacilli less, numerous than normal. He isolated three organisms which gave agglutinating reactions with the bloods of pellagra cases, but also with some normal bloods, so that the results of their investigation so far are only suggestive, and further inquiries will be made on similar lines.

TREATMENT.—E. H. Martin[21] writes on the relative value of **Sodium Arsanilate** and **Salvarsan**, based on 83 cases carefully analyzed, but only 38 were long enough under observation to draw reliable conclusions from. Of 11 cases treated with the former drug, 9 recovered and 2 died, while of 27 under salvarsan, 20 showed apparent cures, 3 improved, and 4 died. From five to twelve doses were given, usually at intervals of seven to ten days, beginning with 0·2 gram, then 0·4, and increasing to 0·1 gram for every twenty pounds weight of the patient. He urges that very many patients now allowed to sink gradually without any radical treatment, can be saved by salvarsan injections.

G. M. Niles[22] advocates the use of **Hydrotherapy** in the treatment.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* 1913, ii, 42; [2]*Ibid.* 258; [3]*Jour. Cutan. Dis.* 1912, 589; [4]*Bost. Med. and Surg. Jour.* 1913, i, 50; [5]*Ibid.* 411; [6]*Ibid.* 233; [7]*Jour. Amer. Med. Assoc.* 1913, i, 1948; [8]*Brit. Med. Jour.* 1912, ii, 1093; [9]*Brit. Med. Jour.* 1913, ii, 19; [10]*Ibid.*; [11]*Ibid.*; [12]*Ibid.* 119;

[13]*Ibid.* 297; [14]*Lancet* 1913, ii, 713; [15]*Ibid.* 717; [16]*Jour. Amer. Med. Assoc.* 1913, i, 889; [17]*Deut. med. Woch.* 1912, 2169; [18]*Jour. Amer. Med. Assoc.* 1913, i, 1423; [19]*Amer. Jour. Med. Sci.* 1913, i, 705; [20]*Ibid.* 801; [21]*N.Y. Med. Jour.* 1913, i, 547; [22]*Amer. Jour. Med. Sci.* 1913, ii, 230.

Beverley R. Tucker, M.D., Richmond, Virginia.

ETIOLOGY.—Pellagra, which has been known in Italy since 1728, and has since been observed in all the countries of Southern Europe, in Asia Minor, Northern Africa, the West Indies, Central America, the United States, and other places, has become a disease of such great importance that it deserves the special consideration of the medical profession the world over. At the present time, it is estimated that there are more than 15,000 cases in Italy and as many as 15,000 in the United States. Its recent occurrence in the United States as far north as New England in the eastern part, and Peoria, Ill., in the central western part, and in England, takes it out of the class of those diseases confined to tropical and semi-tropical countries. More or less coincident with the appearance of pellagra in Italy was the use of corn meal as a food among the poorer classes, and the general impression gained ground that pellagra was a toxæmia originating from spoiled maize.

When in 1907, eighty-eight cases of pellagra were reported in the United States by Searcy, from the Alabama Insane Asylum, it was supposed that pellagra occurred only among the poorer classes, but since then many cases have been reported among those whose hygienic and social surroundings were good.

Thanks chiefly to reports from Italy and the advocacy of Lombroso, when the disease first appeared in the United States the maize theory of causation was generally accepted, but since then it has been largely discarded. People who have never eaten corn products in any form have had the disease, which also occurs in localities where corn is neither raised nor imported. Further, those who have been known to eat fermented or spoiled corn meal for long periods of time have failed to contract the disease. During the Civil War in the United States, the Confederate soldiers ate corn meal, which was often spoiled, as their chief article of diet, and careful enquiry fails to show that the disease was present among these soldiers. It is improper, therefore, from a commercial and economic standpoint, as well as unscientific, to condemn this great staple article of food. Various bacteria, fungi, insects, and toxins have been thought to be the cause of pellagra, but it has not been proved that the disease originated from any of these sources, nor has there been any proof that food, water, or air is the carrying agent. By some the disease has been considered a place infection, but so many cases have occurred singly in a locality that this can hardly be true. Sunlight has been supposed to have a causative relation, but it has been observed that patients may have an increase in their symptoms or a recurrence during the sultry warm days of winter or from sitting by a fire. Heat, and possibly light, may aggravate the condition, but they certainly have nothing to do with the cause

No age is exempt from pellagra, although it is most common between the third and fourth decades of life. Its onset is most frequent in the spring, but it may make its appearance at any season. The cases run a course of a few weeks to a few months, either to death or remission. Those who survive the first attack usually have a recurrence the following spring. In some cases amelioration and recrudescence follow each other every few months. The disease is not considered contagious. As far as the writer has been able to learn, no physician, nurse, or attendant has ever contracted the disease from association with patients.

In view of the foregoing observations, we are brought face to face with a great disease problem. Those who speak dogmatically about the origin of pellagra show ignorance in so doing. The true cause is absolutely unknown. A few facts in this relation, however, seem to be more or less definitely established. It has been the observation of the writer and others of large experience with the disease that it nearly always occurs in debilitated people, and it frequently follows in the wake of such conditions as syphilis, emaciation, alcoholism, morphinism, and tuberculosis. The writer cannot recall having observed the onset of pellagra in a patient who was robust immediately preceding the appearance of symptoms. It has been suggested by Babcock that a monotonous diet, such as is used in charity institutions and rural districts, has some relation to pellagra. Whether this is simply because of malnutrition or because of an analogy to sprue, scurvy, or beri-beri, is unknown. The author, however, is inclined to the former view.

To suggest a field for research, it has recently occurred to the writer that the disease may be oral in its primary location. In looking back over his cases, the majority of them give a history of having started with stomatitis and oral inspection reveals inflamed gums, tongue, and buccal mucous membrane, usually with marked pyorrhœa. It may be that, as in diphtheria or syphilis, there is a focal infection, the focus in this instance being in the mouth, and later, constitutional symptoms become manifest. As far as the writer knows, no special bacteriological investigation has been made of the oral cavity in pellagra.

SYMPTOMS.—These may be divided so as to fall under four general headings: gastro-intestinal, cutaneous, nervous, and mental.

The *gastro-intestinal* tract is inflamed in its whole extent, the mouth being red and sore, usually with considerable salivation. The stomach is inflamed, and there is generally nausea and vomiting. The intestines are also inflamed, which causes, as a rule, severe and sometimes intractable diarrhœa, although some patients have no diarrhœa. There is one thing of great importance about this set of symptoms: it has recently been shown by the writer in the study of the disease in its incipiency that these symptoms of the mouth, stomach, and intestines are usually the first to appear, and they were recorded as primary symptoms in ninety out of one hundred cases.

A few days or a few months after these symptoms, there appears, always on the dorsal surface of the hands and often on the extensor surface, forearms, forehead, alæ nasi, neck, and dorsal surfaces of the feet, an *eruption*, which is usually red at first and resembles sunburn. It soon becomes dark and rough. Thickening and puffiness of the skin may develop, areas of skin may slough off, and large cracks or fissures occur. Itching and burning are not prominent symptoms. As the skin eruption gets well, desquamation takes place. The hand lesion tends to extend around the wrist in an annular fashion, while the line of demarcation is quite distinct on the wrist or forearm. The lesions are always symmetrical. During the interval between the attacks the skin looks either normal, or smooth and glistening. (See *Plates XXXII, XXXIII, XXXIV, XXXV*).

The *nervous* symptoms consist of insomnia, anxiety, giddiness, and sometimes ataxia, change in reflexes and partial paralysis, and, as a rule, follow or are coincident with the cutaneous symptoms.

In regard to the *mental* symptoms the patients may or may not become absolutely insane. When they do, the insanity follows no known type of mental disease. Patients often have delusions and hallucinations. They not infrequently commit suicide, and drowning seems to be the favourite mode. Nearly constant mental symptoms are depression and apprehension.

Neither stomach, fæcal, blood, nor urinary examinations have thrown much light upon the study of pellagra. Hydrochloric acid is often absent from the gastric juice, but this is not constant. Amœbæ are frequently found in the stools, but this is common to other conditions. A moderate and sometimes severe secondary anæmia is usually present. Wassermann reactions are uniformly negative, except in those cases complicated with syphilis. Nothing has been gained by examination of the cerebrospinal fluid.

DIAGNOSIS.—Pellagra without cutaneous lesions can hardly be diagnosed, because diarrhœa with nervous and mental symptoms is common, especially in institutions. The area of distribution of the skin lesions, and especially the fact that those of the hand end in a distinct line of demarcation, are of great diagnostic importance. Losses of weight, insomnia, apprehension, vertigo, and symmetrical cutaneous lesions are practically constant manifestations.

COURSE.—As the disease progresses in the cases in which remission does not take place, the patient goes on to a death which presents a horrible picture. The patient is weak and emaciated. The cutaneous lesions, although not very painful, are distressing in appearance. Stomatitis, gastritis, diarrhœa, and proctitis are usually pronounced. Salivation is often profuse. It may be impossible for food to be retained. The patient frequently is more or less comatose, and when aroused the mind is disturbed by marked hallucinations and delusions. Life may last for days in this distressing state, until death comes as a decided relief.

PROGNOSIS.—This depends upon whether the case goes into a remission or not. About 30 per cent die in the first attack, which may last from a few weeks to a few months; while the others go into a remission, usually during the winter, and may die in from the second to the tenth attack, or may recover entirely. The writer has cases which have remained well since 1909 and 1910, and believes the prognosis may be bettered by the urotropin treatment combined with proper hygiene.

Treatment. —We have no specific for pellagra. **Iron, Mercury,** and **Arsenic** have been of benefit to some cases. Arsenic seems to be most effective when given hypodermically, either in the form of atoxyl or cacodylate of soda. Some cases have been reported as much improved by salvarsan. Several years ago the writer introduced the use of **Urotropin** in pellagra, and considerable experience has confirmed him in the belief that this is the most valuable remedy thus far known. It is administered in 10 or 15 gr. doses in a glass of water every four hours. It seems to act better when some alkali, as for instance half a drachm of bicarbonate of soda, is given with each dose. In a few cases the kidneys are irritated and hæmaturia may be noted. When this occurs, the drug has to be discontinued. Hexamethylenamine, or urotropin, splits into ammonia and formaldehyde, and formaldehyde may be found shortly after its administration in the saliva, sweat, blood, urine, and cerebrospinal fluid. The benefit is derived probably from the antiseptic properties of the formaldehyde. The majority of cases put upon this treatment begin to show improvement in all their symptoms in about three days, and go into remission within three weeks. The earlier the urotropin is administered, the more beneficial are its effects.

In addition to drug treatment, general hygienic measures should be used. Good, nourishing food should be pushed as far as possible, seeing that the diet is varied. Local treatment to the cutaneous lesions seems to have but little effect, and it has been the habit of the writer and other workers in this field to rely rather upon systemic measures.

Possibly no disease offers so wide a field for research as pellagra; and the internist, the neurologist, the alienist, the dermatologist, the pathologist, and the hygienist may all be equally interested. It seems improbable, however, that the disease will be thoroughly understood until it is studied by competent commissions giving their entire time to the solution of its problems.

PEMPHIGUS.

E. Graham Little, M.D., F.R.C.P.

Custance[1] reports an acute case in a man aged 10, clinically typical, in which a *diplococcus* was isolated from the blood and sputum. A **Vaccine** prepared from this organism was injected, in doses increased from 5 to 500 millions, and at intervals of three to six days, and though the case was exceptionally severe, improvement was rapidly obvious under this treatment, and recovery took place. The patient incidentally gave a positive Wassermann reaction, which is explained as probably due to congenital syphilis. The introduction of the diplococcus seems to have been effected by a tattooing, which resulted in an acute septic ulcer.

Leszczynski[2] recommends intravenous injections of **Quinine**, according to this formula :—

℞ Quinin. Hydrochlor.	1	Aq. Destillat.	200 parts
Sod. Chlorat. pur.	1·70		

Of this solution, 100 c.c. injected with 50 c.c. of ·85 per cent saline solution was the initial dose; this would be doubled in later injections, of which as many as fourteen were given in one case. Relief of itching was notable after the first.

Pemphigus Foliaceus.—Kessler[3] has a careful study of two cases. The first was in a Danish woman, aged 56, in whom the disease began in June, 1911, with a blister on the cheek. The disease spread slowly but steadily until, by March, 1912, the entire body was covered with blisters. Nikolsky's sign—the separation of the superficial layer of the epidermis by trauma—was very marked. The temperature ranged from 98° to 104°. The exfoliation of the skin was general and abundant. She was given 10-gr. doses of **Quinine** every four hours for several weeks, without any untoward symptoms. **Bran Baths** were given daily. She appeared to recover completely, and was dismissed from hospital after six months' detention, but six months later had a relapse.

The second patient was a white lad, aged 16. The disease had commenced with a single lesion on the arm, and had spread to cover the whole body, except the conjunctivæ and mucous membranes. This patient lost his finger- and toe-nails. He was given **Quinine** in large doses, 4 to 7 gr., 4-hourly, and **Linseed Baths** with ½ oz. compound solution of **Cresol** to the bath, and cold cream was applied to the joints. He left hospital twelve weeks later, apparently well.

In the discussion supervening on this paper, Sutton reported a case in which pure cultures were obtained of *B. pyocyaneus* which has been frequently associated with this disease, and the patient recovered almost completely within nine weeks, apparently as a result of treatment with autogenous **Vaccines.** At this stage a single dose of **Salvarsan** appears to have completely cleared the skin, and to have benefited the patient so remarkably that he put on 40 lb. in weight in two months. Other speakers had tried salvarsan without much benefit.

REFERENCES.—[1]*Pract.* 1913, ii, 312; [2]*Arch. f. Derm. u. Syph.* 1912, Oct.; [3]*Brit. Jour. Derm.* xxiv, 347; [4]*Jour. Amer. Med. Assoc.* 1913, ii, 192.

PENIS, SURGERY OF. *Priestley Leech, M.D., F.R.C.S.*

Babler[1] reports a case of *primary tuberculosis* of the glans penis in an otherwise healthy man aged 72. It consisted of a hard nodule larger than a filbert, midway between the corona and the meatus. Naturally, malignant disease was thought of, but examination after removal showed that it was tuberculous.

Gerster and Mandelbaum[2] report the *formation of bone* in the human penis. This is a very rare condition. The patient was a man, 49 years old. The bone was oblong, lamella shaped, 3·5 cm. long and 1·75 cm. broad, situated just where the penis emerges from under the symphysis. It was excised; histological examination proved it to be bone.

References.—[1]Ann. Surg. 1913, i, 894; [2]Ibid, 896.

PERICARDITIS. (*See also* Rheumatism in Childhood.)

Carey Coombs, M.D., M.R.C.P.

A rare cause of pericarditis, *gonococcal infection*, was responsible for the case of effusion described by Robin and Fiessinger.[1] The fluid was highly fibrinous; recovery followed puncture through Marfan's point (*vide infra*). Though the organisms were not found in the fluid, its gonococcal origin was indubitable, for the patient had urethritis with gonococci in the discharge, polyarthritis, and enlargement of the spleen.

Fromberg[2] reports a case of some interest in that the pericardial sac contained fluid charged with tubercle bacilli, but without the usual histological features of tuberculosis in its inflamed walls.

Essex Wynter[3] once more calls attention to *absence of abdominal respiratory movement* as an indication of pericarditis. He points out that a knowledge of this fact has very considerable diagnostic import: on the one hand, it may lead to an early discovery of the pericardial lesion, while on the other it may prevent a fruitless laparotomy in search of an inflammatory cause for the abdominal rigidity. It is a reflex immobilization of the diaphragm that is responsible for the loss of abdominal movement, as radiographic examinations demonstrate.

Wynter believes in the **Salicylate** treatment of rheumatic pericarditis, but thinks that internal administration alone is inadequate; he supplements it by daily applications of an ointment, containing methyl salicylate 2 dr. in lanolin 1 oz., to the præcordium, renewing it daily for four or five days.

Cardiolysis.—Dunn and Summers[4] performed this operation to relieve a patient with mediastinopericarditis; the subsequent history is not long or explicit enough to show whether the expected benefit was realized. Portions of the second to sixth left ribs with their costal cartilages were resected flush with the sternal margin. In Simon's[5] case, the adhesions were possibly due to rheumatic carditis; temporary improvement followed an operation consisting of resection of ribs and breaking-down of adhesions, but the boy died within twelve months, of cardiac failure. The first-named authors say that cardiolysis is not to be expected to relieve a heart enmeshed in pericardial adhesions if these are due to polyserositis or to tuberculosis, or if the heart itself is diseased; the indications for this operation are therefore very restricted, unless it is frankly undertaken to give more space to an enlarged heart rather than to liberate it from adhesions.

Drainage of Pericardial Effusions.—In a careful and exhaustive monograph, Blechmann[6] considers the whole subject of pericardial effusion, but with especial reference to diagnosis and treatment. Serous and hæmorrhagic collections are curable, he thinks, by simple paracentesis, though sometimes those which are provoked by tuberculosis of the sac call for pericardiotomy without subsequent drainage. Purulent exudation, on the other hand, always requires drainage after free opening—the nature of the fluid can, of course, be ascertained only by exploratory puncture. Blechmann considers the various methods in use, and condemns those that attack the sac through the anterior chest wall, since they introduce dangers (puncture of pleura and heart, wounding of mammary vessels) without any compensating advantages. Indeed, the method which he extols, that of Marfan, claims as its advantages, not merely the negative one of avoiding dangers, but also the positive one of finding the fluid. He shows that the heart lies in front of and slightly above the effusion, so that this should be approached from below, a line of attack that is profitable for purposes of drainage, since it enlists the force of gravity on its side. The actual path of approach traverses the skin at the tip of the xiphisternum, and passes upwards behind the latter through the diaphragm into the pericardium, avoiding the peritoneum. The patient half lies down on his back; and local anæsthesia may be used. The tip of the index finger of the operator's left hand rests on the tip of the xiphisternum as a guide, and the needle (a small Potain trocar or a lumbar puncture needle) is introduced through the middle line immediately below the tip of the xiphisternum; it is then passed directly upwards for a distance of 2 cm., hugging the posterior deep surface of the xiphisternum. The point of the needle should next be directed slightly backwards and still upwards, to reach the pericardial sac. He recommends a similar route for incision of the pericardium where this is indicated, an operation advocated in this country by Ogle and Allingham, the actual line of incision corresponding with the left costal border. These procedures have given satisfactory results in the hands of various operators, though experiences hitherto published are of necessity few in number.

REFERENCES.—[1]*Lancet*, 1914, i, 768; [2]*Deut. med. Woch.* 1913, 1330; [3]*Can. Jour.* 1913, 183; [4]*Amer. Jour. Med. Sci.* 1914, i, 73; [5]*Brit. Med. Jour.* 1912, ii, 1040, and 1914, i, 1050; [6]Paris, Baillière et Fils, 1914.

PERICOLIC MEMBRANES.

Sir Berkeley Moynihan, M.S., F.R.C.S.,
Harold Upcott, F.R.C.S.

Since he drew attention to this condition in 1908, Jackson has observed and operated upon numerous cases.[1] He emphasizes the fact that this membrane in no way agrees with the ordinary conception of an adhesion. He considers the various theories which have been put forward to explain the cause or origin of membranous pericolitis, and expresses his own view that all cases have not the same etiology. Some cases support the view of Kelly and Coffey that the membrane represents the prolongation of the omental attachment along the anterior muscle band of the ascending colon. Most cases, however, suggest that the membranous structure is peritoneum loosened from its close connection with the abdominal wall and colonic surface by some serous exudate, after which the vascularization and connective tissue banding has occurred as a chronic reaction to irritation (Hall).

The principal *symptoms* are pain, of varying intensity, diffused over the right side of the abdomen, and often of abrupt onset; diffuse tenderness of right side of abdomen, or even hyperæsthesia, but without muscular rigidity, points of greater tenderness being frequently found low down in the groin, at McBurney's point, or just beneath the costal margin; marked constipation, which may be relieved for a time by free purgation; overfilling of the cæcum with gas, often causing great distress; and mucous diarrhœa, which may alternate with the constipation. Gastric disturbances, loss of weight, and neurasthenic symptoms complete the list.

The *surgical treatment* should, in the majority of cases, comprehend the removal of the obstructing pericolic membrane, supplemented by cæcal plication. In more advanced cases, some form of plastic anastomosis or short-circuiting may be necessary.

From a study of twenty-nine instances where he has met with some form of pericolic membrane at operation, Flint[2] thinks they may roughly be divided, according to their distribution, into three groups. The commonest is that where the membrane extends from the parietal peritoneum along the lateral margin of the colon, particularly near the hepatic flexure, over into the lateral and ventral aspects of the colon and cæcum.

Another type occurs lower down, the membrane passing over into the head of the cæcum, and usually covering the proximal half and, more rarely, the entire appendix. The third and rarest type of veil extends from the ventral aspect of the colon, and passes inwards to become continuous with the omentum. It often holds the ascending and first part of the transverse colon side by side, with a sharp angulation at the hepatic flexure.

From dissection of a series of human embryos and two infants at full term, Flint has found conditions which show clearly that these veils are embryonic and normal structures. After rotation of the gut, the cæcum becomes attached to the peritoneum of the posterior abdominal wall just beneath the liver.

In some instances these secondary attachments are more extensive than in others, and during the subsequent descent of the cæcum they become drawn out into the membranous veils described by Jackson. Flint thinks it is certain that they are not the products of inflammation or the residue of repeated attacks of colitis.

While generally speaking these membranes are not responsible for any symptoms, there can be no doubt that in certain cases they interfere with the mechanical functions of the colon, and give rise to attacks of pain and distress in the right side of the abdomen. Embryonic veils which embrace the appendix, kink it, and are probably responsible for many of the cases of chronic appendicitis in which they occur. They are to be clearly distinguished from adhesions about the appendix resulting from previous infections.

Where the membranes are causing any hindrance to the propulsive functions of the colon, they may be incised; this is all that is required. After dividing them, and also Lane's ileal band, Flint trusts to the post-operative distention of the gut to prevent their re-formation.

REFERENCES.—[1] *Ann. Surg.* 1913, i, 574; [2] *Johns Hop. Hosp. Bull.* 1912, 392.

PERITONITIS.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

A useful study of *peritoneal adhesions* has been carried out by Adams,[1] who found that the only reliable method of inducing non-infective adhesions was by introduction of sterile foreign bodies. Chemical irritants were much less reliable, and the effects of scarlet red were negative. Merely rubbing the peritoneal surfaces with sterilized gauze could not be depended on to ensure the formation of permanent adhesions.

In his investigations, Adams was naturally led to study the functions of the omentum, and he considers that it plays an important part in the restoration of damaged peritoneal surfaces. It becomes adherent to any bare area within the field of its excursion, and supplies numerous endothelial and connective-tissue-cells to the denuded surface. Unless the omentum itself becomes fibrotic, such adhesion persists only until the damaged area is healed. He thinks that this function of the omentum should be utilized by the surgeon to prevent the formation of post-operative sterile adhesions by the application of omental grafts over any areas that have been stripped of peritoneum. The use of lubricants, such as oil or vaseline, appears to be valueless.

When the surgeon desires to promote the formation of adhesions, a foreign body, such as a piece of sterilized gauze, should be fixed in position until the second or third day, by which time fibroblasts will have appeared in the inflammatory tissue.

Danielsen[2] reports a case which presented the symptoms of peritonitis attributed to appendicitis. On opening the abdomen, a quantity of pus was found among the intestines, having the odour commonly associated with a perforated appendix. The appendix, however, showed no evidence of disease. While wiping the pus out of the pelvis he observed a segment of a tape worm adhering to the gauze. Further portions of the parasite were then removed. On examining the intestine, he found a perforation in the ileum about twenty inches above the ileocæcal valve, the serosa surrounding it being inflamed and purulent. This segment was resected and the ends were anastomosed. Further search discovered the head of the worm among the fimbriæ of the right Fallopian tube. A small ovarian cyst was also present, showing on its surface an inflamed granulating area; this was resected with the tube, which still contained the head of the worm.

He thinks that the perforation was not caused by the worm, but that a purulent salpingitis led to adhesions between the intestine and the fimbriated end of the tube. An abscess formed among the adhesions and discharged into the intestine. The free drainage thus established allowed the salpingitis to heal, but the end of the parasite escaped through the perforation, and by its movements loosened the adhesions, thus allowing the escape of intestinal contents into the peritoneal cavity.

REFERENCES.—[1] *Lancet*, 1913, i, 603; [2] *Münch. med. Woch.* 1913, 411.

PERTUSSIS.

Frederick Langmead, M.D., F.R.C.P.

TREATMENT.—Fletcher[1] has obtained some success with **Adrenalin.** He has used it in forty cases in doses varying from 1 to 3 min. of a 1–1000 solution given every three or four hours by the mouth. There was decided benefit in practically every one. It was exceptional under this treatment for the attack to last for more than three weeks. In his experience adrenalin checks the vomiting quickly, thus producing marked improvement in the patient's general condition before the cough has ceased. Lord[2] records another case which benefited under the same treatment.

The discovery in 1905 by Bordet and Gengou of a bacillus which they regard as the cause of the disease has led to the employment of **Vaccines.** These writers describe the bacillus as a little ovoid micro-organism, resembling that of Pfeiffer, somewhat elongated at times, but frequently so short as to appear like a micrococcus. As Scott[3] points out, the principal argument in favour of this organism being the cause appears to be furnished by a study of the specific properties of the serum. The sera of children who have never had whooping-cough, or have had it a long time before, does not agglutinate the bacillus, whilst the sera of children who have recently suffered have a moderate and constant agglutinating power. Twenty children injected with Bordet's pertussis vaccine developed a severe negative phase. Klimenco and Fraenkel were able to produce apparently typical whooping-cough by injecting the bacillus into monkeys. This organism is found in the early stage of the disease, in the expectoration which comes from the depths of the bronchi, after a paroxysm. Such a sputum contains it in considerable numbers, and in favourable cases gives an almost pure culture. Ladd, of Boston, has prepared a vaccine of the organisms grown on blood-agar and killed by heating in a water-bath at 60° C. for one hour. He reports no ill-effects from its use, even in doses of 40,000,000 bacteria, in nine cases. Graham records twenty-four cases whom he injected with 40,000,000 bacteria every three days. The number of paroxysms became less, their severity diminished, cyanosis was less marked, and the vomiting decreased. Seven were probably not benefited. Scott's own patients number seventeen. He regards fourteen as being cured by the vaccine, and the remaining three as improved. He injected the vaccine into the buttock. In his opinion, stronger doses should be given in the early stages. Wilson[4] has used it in twenty-four cases, and concludes that it rapidly controls the spasms, that the improvement is somewhat proportionate to the systemic reaction, and that when this is very feeble it should be excited with cacodylate of sodium or some similar remedy. The infective element appears to vanish with the paroxysms, the cases shortly afterwards losing their infectivity, and no longer calling for specific treatment. Mather Sill[5] has used the original vaccine in thirty-six cases, and a mixed vaccine, consisting of *B. pertussis*, *Staphylococcus aureus*, and *M. catarrhalis*, in ten others. The average length of time taken to produce a cure in the first series was four and a half weeks. In the second series the average duration of the attacks after vaccine treatment was begun was three and a half weeks. He regards vaccine-therapy as the best treatment for the disease. He also used it as a prophylactic measure in three children who, though exposed to infection, did not contract the malady. Lagane[6] believes that antipertussis vaccine will prove of greatest value as a prophylactic agent.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, ii, 1748; [2]*Ibid.* 1913, ii, 122; [3]*N.Y. Med. Jour.* 1913, i, 170; [4]*Ibid.* 823; [5]*Amer. Med.* 1913, 440; [6]*Presse Méd.* 1913, 606.

PINEAL GLAND.

Herbert French, M.D., F.R.C.P.

Simultaneously with the experimental, surgical, and clinical investigations that are being made upon the functions of the pituitary body, similar work is being carried out in connection with the pineal gland. A full review is given by L. J. Kidd,[1] whose general conclusions are that the pineal gland, far from being merely a degenerating morphological remnant, has important functions in all animals possessed of the organ; and that one of the chief of these functions is control of the development of the genital organs in the male, and possibly also in the female. A prominent feature of cases in which pineal tumour has developed in childhood is precocious hypertrophy of the penis and testicles, with development of pubic hair in infancy; whilst at the same time the metabolism of the body generally and of the nervous system is abnormal, resulting in overgrowth of the subcutaneous fat and under development of the mental powers. This recalls the similar changes that may result from disorders of the pituitary body or of the suprarenals; possibly there is an interrelationship between the three.

Berkeley, in the same paper, records the apparent good results, and the enthusiasm aroused among the teachers, by the use of pineal gland in the treatment of certain backward children in a New York School. In making the preparation, twelve bullocks' pineals, perfectly fresh, were rubbed up with a suitable amount of milk sugar till extinguished; the mass thus obtained, after thorough drying, was distributed into one hundred capsules; and the dose employed was from two to three of these capsules per day. The protocols of the cases are given, and from them one is not so much impressed by the evidence of therapeutic benefit as the actual observers of the patients appear to have been; but there are indications that the treatment merits extended trial and further investigation.

The following table of comparison between pituitary and pineal-gland defects has been drawn up by Dana and Berkeley[2]:—

PATHOLOGICAL AND PHYSIOLOGICAL EFFECTS ATTRIBUTED TO THE ACTIVITIES OR DISORDERS OF THE

Pituitary Body	*Pineal Body*
Adiposity Sexual changes Genital atrophy and infantilism Acromegaly and gigantism Polyuria Control of carbohydrate metabolism Lowered temperature Co-ordinate action with other glands	Adiposity (later sometimes a marked atrophy of fatty tissues) Early development of sexual organs and functions Early bodily and mental maturity (Macrogenitosomia of Pellizi)
Physiological action of extracts of the gland :— Pressor and depressor effects on blood-vessels Galactagogic effect Stimulation of muscles of pupil, uterus, and intestines Modifications of metabolism and bodily growth Modification of carbohydrate metabolism	*Physiological action of extracts of the gland* :— Contradictory reports as to pressor and depressor effect on blood-vessels Stimulation of unstriped muscular tissue of intestines, uterus, pupil Vasodilatation of genitalia and kidney Transitory diuresis Glycosuria Stimulation of metabolism (Berkeley)

REFERENCES.—[1]*Med. Chron.* 1912, Dec. 154; [2]*Med. Rec.* 1913, i, 835.

PITUITARY BODY, DISEASES OF. (*See also* BRAIN, SURGERY OF; DIABETES INSIPIDUS.)

Herbert French, M.D., F.R.C.P.

Cushing[1] suggests that disturbance of the pituitary gland secretion is responsible for the syndrome of Fröhlich described by the term "dystrophia adiposogenitalis," and believes that this syndrome arises when there is hyperplasia of the anterior lobe of the pituitary body simultaneously with secretory stasis or insufficiency of the posterior lobe. It may develop gradually from early infancy onwards, or it may occur rapidly in later life when there has been no indication of the overgrowth of the fatty tissues and of the genital organs in childhood. *Fig.* 44 indicates the kind of clinical condition that results.

In some of Cushing's cases there were definite signs of cerebral tumour; but he holds that it ought to be possible to recognize hyperpituitarism and hypopituitarism in cases in which there is no actual tumour-formation. The patient as a rule suffers from polyuria, polydipsia, and polyphagia. He points out that the functions of the pituitary gland may be interfered with considerably, not merely by tumours in, or in the immediate neighbourhood of, the gland itself, but also by lesions situated in the brain at a distance from the pituitary body. He discusses[2] cases of dyspituitarism under the following headings: (1) Those in which not only the signs indicating distortion of neighbouring structures, but also the symptoms betraying the effects of altered glandular activity, are outspoken; (2) Those in which the neighbourhood manifestations are pronounced, but the glandular symptoms are absent or inconspicuous; (3) Those in which neighbourhood manifestations are absent or inconspicuous, though glandular symptoms are pronounced and unmistakable; (4) Those in which obvious distant cerebral lesions are accompanied by symptomatic indications of secondary pituitary involvement; (5) Those with a polyglandular syndrome in which the functional disturbances on the part of the hypophysis are merely one, and not a predominant feature of a general involvement of the ductless glands. Under each of the first four groups there will naturally occur three subdivisions, namely (a) The cases in which the clinical manifestations of past or of existing *hyperpituitarism* predominate (more particularly overgrowth resulting in gigantism when the process antedates ossification of the epiphyses—

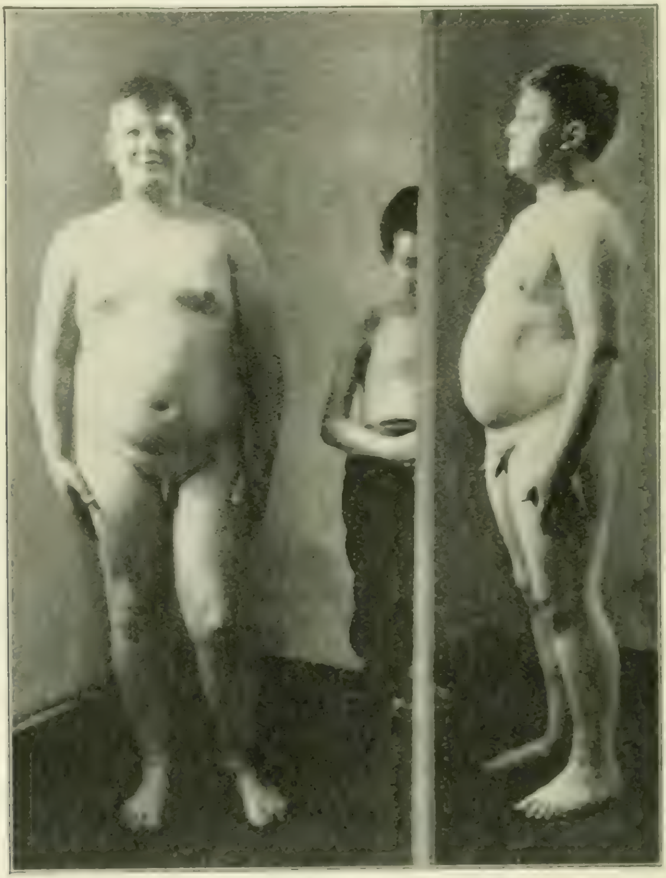

Fig. 49.—Case of dystrophia adiposogenitalis.

typus Launois; resulting in acromegaly when it is of later occurrence—*typus Marie*); (*b*) Those in which the clinical manifestations of *hypopituitarism* predominate (adiposity, with a persistence of both skeletal and sexual infantilism when the process originates in childhood—*typus Fröhlich*; adiposity with sexual infantilism of the reversive form when it originates in the adult—a type he has explained on experimental grounds); and (*c*) The mixed or transition cases exhibiting features of both states.

Von Bonin[3] also records full details of a case of dyspituitarism, and summarizes the literature. He believes that the abnormal growth changes in acromegaly are not confined to the skeleton, or indeed to any part, but occur everywhere, their degree depending upon the intensity of the stimuli acting upon the different tissues. He holds that acromegaly is in all probability due to an excessive activity, whilst sexual infantilism, as also a general diminution of metabolism, is due to a deficient activity of the anterior lobe of the pituitary body. On the other hand, deficiency in either the anterior or posterior lobe produces adiposity. He also points out that some of the tumours of the pituitary body which appear at a first glance under the microscope to be sarcomatous, are really cellular overgrowths of the gland, and calls them round-celled adenomata.

REFERENCES.—[1] *Amer. Jour. Med. Sci.* 1913, i, 313; [2] *Pituitary Body and its Disorders*, Lippincott, London, 1912; [3] *Quart. Jour. Med.* 1913, Jan. 125.

PLAGUE.

Leonard Rogers, M.D., F.R.C.P.

R. P. Strong[1] has recorded a full account of his experiments in relation to pneumonic plague carried out at Manila after his return from studying the great Manchurian epidemic, which throw important light on that remarkable outbreak. After giving a graphic description of the conditions of work at Mukden during the actual epidemic, he records experiments on the method of transmission of the infection of pneumonic plague. The exposure of plates of culture media within short distances of the mouths of the patients showed that the plague bacilli are not disseminated by deep breathing alone, but if talking or coughing occurs the organisms are expelled in small droplets of moisture and can be easily grown, so that direct infection through the air is easy. As many as one hundred colonies were sometimes obtained in almost pure culture after a single cough. No definite bacteriological evidence has been produced that healthy carriers ever transmitted the disease. Every patient in whose sputum plague bacilli were found, died of the disease. Experiments were also carried out by O. Teague and M. A. Barber on the influence of atmospheric temperature and moisture upon the spread of pneumonic plague. It will be remembered that the Manchurian epidemic occurred during intense cold, down to as low as 30° C. below zero, and varying between −9° and −32° C. At such temperatures the rate of evaporation of moisture would be only from $\frac{1}{25}$ to $\frac{1}{50}$ of its rate at a temperature of 30° C. and 70 per cent of humidity, such as often occurs during the prevalence of bubonic plague in India. A series of experiments showed that plague bacilli died less rapidly than cholera vibrios, but more quickly than *M. prodigiosus*, when exposed to drying in the air. At ordinary temperatures the latter, when sprayed into the air in fine droplets of moisture, died in a few minutes, but at a cold temperature and in a saturated atmosphere they remained alive for a very much longer time. As the infection took place in the Manchurian plague pneumonia epidemic during intense cold, and in terribly close and overcrowded rooms, in which the air soon becomes nearly saturated with moisture, the spread of the disease to constitute a formidable epidemic, such as has never occurred in the totally different air conditions of the plains of India, is readily explained. It is also of interest to note that the only appreciable plague pneumonia outbreak in India actually occurred in Cashmere during very cold weather.

In the next section Strong and Teague record experiments on the mode of infection of pneumonic plague by exposing animals in confined atmosphere into which a fine spray containing plague bacilli is passed for a short time. In the case of guinea-pigs infection took place through the throat and tonsils, pneumonia being only rarely produced. On the other hand, in the case of monkeys primary plague pneumonia was always produced in this way, while it was very rare for the throat glands or tonsils to be infected. Primary plague septicæmia may occasionally arise, though rarely before visible lesions have taken place either in the lungs or lymphatic glands. These experiments fully explain the mode of direct infection in pneumonic plague and the deadliness of the disease, as the organisms are present in far larger numbers in the lungs than they are even in the spleen in other modes of infection.

The pathological anatomy is next described, and illustrated by a number of excellent coloured plates. A number of strains of plague-pneumonia bacilli were carefully studied, but they were not found to be more virulent than those from the common bubonic forms of the disease, nor were they less virulent towards the end of the outbreak than earlier. The susceptibility of several animals said to have been infected during the epidemic was tested. Tarbagans, a species of marmot incriminated in the origin of the outbreak, were readily inoculated with the disease, and could also be infected through the lungs on being made to inhale plague bacilli. Donkeys could not be infected by the latter method, while dogs were only moderately susceptible.

Strong and Teague also investigated inoculation as a protection against pneumonic plague; but although a non-virulent living culture was used, no appreciable success was obtained with the experimental animals. M. A. Barber experimented with accurate doses of one plague bacillus upwards, and showed that even a single organism may suffice to infect, but that animals infected with very small numbers survived nearly twice as long as those receiving three-fourths of a million or more. These observations support the view of the English Plague Commission that sufficient bacilli may enter the abraded skin from the feces of infected fleas, whose intestines may contain very large numbers of plague bacilli. Lastly, this very valuable report concludes with experiments to determine if the masks worn over the nose and mouth while attending pneumonic plague cases at Mukden are efficient in keeping out bacteria sprayed into the air. A pad of cotton-wool bandaged over the face did not prove to be completely bacteria-proof, although it appears to have afforded very great protection in actual practice. Somewhat better, but not perfect, results were obtained with Bronquet's mask, made in the form of a complete hood of light canvas or khaki cloth completely covering the head, in the front of which is a window of mica or sheet celloidin. It is therefore clear that, even with these masks, Strong was exposed to very great risks while carrying out his invaluable investigations among the pneumonic plague cases in Manchuria who, before his arrival, had received practically no attention through fear of infection.

The English Plague Commission have issued the seventh report of their investigations,[2] which deals with a variety of points. The causes of the remarkable immunity of Madras city to any extensive infection have been enquired into. A sufficiency of rats and fleas was found, while the rats were far more generally susceptible to the disease than in many places which have suffered from plague. A small outbreak did occur on the outskirts of the town, but was promptly and adequately dealt with by the sanitary authorities, and apparently eradicated. The passport system, introduced by Colonel King, lately Sanitary Commissioner of Madras, must be given credit for at least limiting the importation of cases of the disease, while his good sanitary organization has proved of great value in preventing a foothold being obtained in the Presidency town of Madras, the only Indian town of its kind to have escaped a severe epidemic. Further statistics regarding human and rat plague in Bombay are recorded. Extensive inoculations of wild rats caught in various parts of India, to test their degree of immunity, have been carried out, which clearly show that they are most immune where plague has been most severe and prolonged, and least where epidemic plague has not occurred, as in Madras city. This immunity may be transmitted by the parents to their offspring who have not been exposed to plague. Chronic and resolving plague is again dealt with at length, and many new data are recorded, while the condition has been produced experimentally, and its stages traced. Further experimental plague epidemics in rats are recorded, which confirm previous ones. Interesting observations on flea-breeding are given, which show that the process is most active in wet weather with a moderate temperature, and least active under dry and hot conditions, the humidity being the most important factor at Poona. The seasonal variations correspond to those of the natural prevalence of fleas on rats. Adult fleas live longer in a cool and moist atmosphere than in a hot dry one.

J. Guiteras[3] describes a small outbreak of three cases of plague at Havana, in which vigorous steps were taken to destroy rats and disinfect the houses, with the result that during the following two months no further cases occurred. R. H. Creel[1] deals with the eradication of plague in Porto Rico. The most important measures were making the houses rat proof, and trapping the rats. The infection was discovered within four days of its importation; and when the rats were reduced to about half the original numbers, plague cases ceased to occur, the duration of its prevalence having been eighty-four days. The infection appears to have been carried to some other towns through freight. By the inspection of packages which might harbour rats, a number were caught. The average number of fleas on the rats was low.

W. Glen Liston[2] contrasts the epidemiological features of bubonic and pneumonic plague, and shows that the rats of towns which have repeatedly suffered from plague develop a relative immunity to the disease.

Wu Lien Teh and G. L. Tuck[3] has investigated the relationship of the *tarbagan* (Mongolian marmot) to plague, and concludes that although this animal occasionally suffers from the disease, the epizootic is never extensive, and does not play nearly so important a part in the spread of plague as does the rat. In fact, the direct relationship of the marmot to human plague may be considered negligible.

TREATMENT.—Aumann[4] reports one case of plague treated with **Salvarsan** intravenously, the patient dying after eleven days without any evident result from the treatment. F. P. Conner[5] records three cases of plague in which 7 min. of **Tincture of Iodine** in 1 dr. of distilled water was repeatedly injected intravenously, with recovery in all three, although one was a very severe case.

Further trials of **Anti-plague Serums** have been made by the English Plague Commission (whose report is discussed above) under carefully controlled experimental conditions, and the conclusion is reached that they are at present of very little use, and do not constitute a practical method of reducing the mortality from plague in India. The latter part of the report is occupied with papers by S. Rowland on his further studies at the Lister Institute of the production of immunity by means of the nucleo-protein he has separated from plague bacilli, which are of a highly technical nature. He has been unable to confirm Besredka's statement that sensitized organisms yield an atoxic vaccine. R. St. J. Brooks contributes a section on the opsonic index in plague vaccination, and finds that only the nucleo-protein affects it. Lastly, MacConkey deals with the preparation of antitoxic plague serum, but finds that so far, its antitoxic value has not been high.

A. P. Goff[6] describes an outbreak of plague at Manila after six years' freedom. The disease is thought to have been introduced from China. Immediate steps were taken to capture and destroy rats, very few of which were found to be infected. The best poison was arsenic mixed with rice, so that a few grains of the latter formed a fatal dose. Blood puncture on admission, with cultures and guinea-pig inoculations, were used for diagnostic purposes; by such means alone can "climatic buboes" be distinguished from plague during the first two or three days. Large doses of **Serum** prepared in the Government laboratory were injected intramuscularly; 20 per cent of the admissions and 12½ per cent of the total cases recovered.

R. Row[10] records favourable results in the treatment of non septicæmic plague in Bombay with a glycerinated pest **Vaccine.**

REFERENCES.—[1]*Phil. Jour. Med. Sci.* 1912, 521; [2]*Jour. of Hyg.* 1913, Plague Suppl.; [3]*Jour. Amer. Med. Assoc.* 1912, ii, 1780; [4]*Ibid.* 1913, i, 1527; [5]*Jour. Trop. Med.* 1913, 237; [6]*Lancet*, 1913, ii, 529; [7]*Deut. med. Woch.* 1912, 2166; [8]*Jour. Lond. Sch. Trop. Med.* vol. ii. Pt. 2, 148; [9]*Jour. Amer. Med. Assoc.* 1913, i, 2042; [10]*Jour. Trop. Med.* 1913, 293.

PLEURAL EFFUSION. (*See also* EMPYEMA; LUNG, SURGERY OF.)

J. J. Perkins, M.B., F.R.C.P.

TREATMENT.—V. Gilbert in 1891 first treated tuberculous pleurisy with **Serofibrinous Effusion** by the subcutaneous injection of a small amount of the fluid withdrawn by the aspirator. He found that within a few days after, the pleural exudate disappeared. This method, Fishberg[1] says, is now gaining recognition, and Eisner's experiments prove that it has a scientific basis. During the last four years he has tried it in twelve cases, and though it is not uniformly successful, he believes that it has sufficient merit to warrant its more general adoption. A syringeful of the fluid is withdrawn, and the cannula pulled out until it has left the pleural cavity; it is then turned round into the subcutaneous tissue at the site of puncture, and the aspirated fluid slowly expelled. Of course the fluid may be injected into the cellular tissue in any region. Fishberg has found the injection of 2 to 5 c.c. just as satisfactory as larger quantities. The events which follow in a successful case are increased diuresis, and the gradual diminution of the effusion, until within a week or ten days the fluid has entirely disappeared. The advantages of the method are entirely confined to its effects upon the pleural effusion, no influence having been observed on the after-development of the tuberculosis. The method may have to be repeated several times before the fluid is completely absorbed.

An illustrative case may be quoted—a child, aged 5, suffered from a pleural effusion filling about three-fourths of the right chest and producing profound dyspnœa. During the three weeks effusion was present, exploratory puncture was performed twice, and once 7 oz. of fluid were removed by the aspirator, but the fluid reaccumulated within three days. Soon after the injection of 3 c.c. of the fluid into the subcutaneous tissue of the chest, the effusion began to show signs of absorption, and disappeared within a week. Of course not all the cases were so completely successful, while it must be owned that in some the method was a complete failure.

Various theories have been advanced by way of explanation, but none that is universally accepted. One fact which is interesting is that after autoserotherapy leucocytosis occurs, the cell-count in one instance rising from 7,800 to 15,000. It has been suggested that the accumulation of autolytic products in the exudate is responsible for its absorption. Zimmermann found that an injection of a solution of peptones brings about leucocytosis, and also increased diuresis, just as after autoserotherapy.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1913, i, 962.

PNEUMONIA. (*See also* PNEUMONIA, EPIDEMIC.)

J. J. Perkins, M.B., F.R.C.P.

TREATMENT.—Fleming[1] controverts the usual view that the firm, opaque *fibrinous clots* found in the right heart in croupous pneumonia are due to post-mortem clotting; in his eyes these clots are of ante-mortem formation, and from this he deduces important clinical lessons. The frequency of such clotting is seen from his post-mortem statistics: in 61 cases of lobar pneumonia, 39 showed ante-mortem clotting in the right auricle, right ventricle, and pulmonary arteries. Of the 39, in 16 the clot was adherent and extensive, while in the remaining 23 it was mostly colourless but non-adherent. By way of contrast he examined 162 consecutive cases post mortem, eliminating those of lobar pneumonia, and found ante-mortem or colourless clotting in only 20. Hence he argues that **Stimulation of the Heart** should be the routine treatment for all cases of croupous pneumonia, and he would give early and continuously a direct cardiac tonic, such as digitalis or strophanthus. Diffusible stimulants should be given at once if the heart shows any signs of difficulty. The most obvious signs of such thrombosis are engorgement of the jugular vein, and weakening and later disappearance of the pulmonary second sound. He keeps a careful watch on the veins of the neck, and the slightest engorgement indicates the need of increased stimulation. Equally important is the second sound in the pulmonary area. In almost every one of his cases in which post mortem there was extensive ante-mortem clotting, the right heart was markedly dilated. The failure of the second sound in croupous pneumonia, however, means more than cardiac failure: thrombosis has begun, and the thrombus is mechanically interfering with the closure of the pulmonary valve. In addition to those measures mentioned above, he believes in the use of **Oxygen** to counteract the excess of CO_2, which according to Wiener aids clotting, and in **Change of Position.** He would, however, allow **Bleeding** only in particularly robust patients, as it may only promote thrombosis. Citric acid he considers futile.

Vetlesen[2] reports 11 cases of croupous pneumonia treated by **Ethylhydrocuprein,** the drug introduced in the early part of 1912 by Morgenroth, from the use of which so much has been hoped. The cases reported were in hospital patients taken in ordinary succession as admitted, not especially benign, and placed under treatment at an early stage. The drug was given in three separate doses daily of 0·5 gram, in obedience to Morgenroth's dictum that transient disturbances of vision, such as may appear after its use, necessitate caution, and that therefore the total amount administered should not exceed 1·5 gram per diem. Of the 11 cases, defervescence occurred in 3 in less than forty-eight hours after the onset of the disease; in 2 cases after two and a half days; in 2 more in three days and a half; in 1 after four days; and in 1 after eight days. In two other cases in which it was given, death occurred, but one of these was found post mortem to be a case of tuberculosis, though no tubercle bacilli were found in the sputum during life; the other a case of gangrene possibly due to malignant endocarditis. The 9 cases of croupous pneumonia all recovered, and Vetlesen's verdict on the drug is generally favourable, as he believes it tends to shorten the course of the disease, though he insists that it must be given at the earliest possible moment.

This favourable verdict is hardly borne out by Sir Almroth Wright's[3] investigations. His experiments at first sight seem to be of good promise: while ordinary antiseptics expend their energy wastefully upon the blood fluids, we have in the new drug a chemical agent which exerts its effect practically undiminished in serum. For example, one part of lysol in 62,500 parts of water kills the pneumococcus, but one part in 500 parts of sera is required; whereas for ethylhydrocuprein 1 part in 400,000 parts of serum kills the pneumococcus, and 1 in 800,000 inhibits the growth. The antiseptic values of the serum dilutions of the drug do not differ appreciably from the values obtained from watery solutions, showing that the drug exerts its bactericidal effect specifically upon the pneumococcus. Morgenroth's own experiments on mice inoculated with cultures of pneumococcus which killed without exception every untreated mouse, showed that if it was administered beforehand it prevented the development of the infection in some 90 per cent of the animals, and cured about 50 per cent if given after inoculation. Unfortunately, it could not be found that the course of pneumonia in man was favourably influenced by its exhibition, at any rate to any great extent, and in this Wright is at one with many observers. He lays stress on the tendency of the drug to cause amaurosis, and places this new discovery in the class of drugs which are either useless or doubtfully efficacious.

Solis-Cohen[4] still upholds the great benefits which result from massive doses of **Quinine** in pneumonia. He now uses the double hydrochloride of urea and quinine, a 50 per cent solution being injected intramuscularly. A fairly strong adult receives as an initial dose 15 to 25 gr., and the injection is repeated, but with a dose not exceeding 15 gr. every third hour until the temperature falls and remains below 102·2° F. One-half grain of **Cocaine** or of **Caffeine**, or 1 c.c. of 1–1000 posterior **Pituitary** principle, is injected hypodermically at the same time, and repeated every third hour until the systolic blood-pressure measured in millimetres of mercury rises and remains above the pulse-frequency in beats per minute (Gibson's law). He does not think it wise to continue the three-hourly injections after the first twenty-four hours; but in cases where the desired effect has not been reached, they are continued at intervals of six hours.

REFERENCES.—[1]*Edin. Med. Jour.* 1913, ii, 213; [2]*Berl. klin. Woch.* 1913, 1473; [3]*Lancet* 1912, ii, 1633; [4]*Journ. Amer. Med. Assoc.* 1913, ii, 107.

PNEUMONIA, EPIDEMIC.

E. W. Goodall, M.D.

In the spring of 1911 an outbreak of an acute febrile disease occurred in a boys' industrial school at Tranent, near Edinburgh. As during the years 1900 to 1911 a series of similar outbreaks had taken place in this school, an investigation, ordered by the Home Office, was made by Charles M'Neil and J. P. M'Gowan, who have published a report.

The number of boys in the school is usually about 170. Their ages range from five to sixteen years, but most of them are ten or over. The total number of cases during all the outbreaks was 246. The reporters found that they could divide these into three classes, but that there were certain symptoms common to all.

The onset was exceptionally sudden and attended with great prostration, headache, vomiting, and high fever. Coma and delirium in varying degree were present in a large proportion. Even in the mildest there was a kind of stupor. Mental irritability was observed in several. Sharp pains in the back, muscular cramps, and twitchings were fairly common. There was cyanosis, with a rapid, weak, and irregular pulse. The respiration-rate was but slightly affected. In some of the fatal cases there was Cheyne-Stokes breathing. But "the grunting, short, laboured breathing, characteristic of typical lobar pneumonia, was notably absent." Cough and expectoration are as often absent as present in the pneumonic cases; the sputum is rusty, but never sticky; in several of the fatal cases there was a slight cough, with scanty, sanguopurulent expectoration. Herpes was occasionally present. The blood showed a polymorphonuclear leucocytosis more or less marked.

The three groups of cases were as follows: *Group I* (acute fatal illness, 20 cases). Death took place in a few hours from the onset. In two cases, indeed, the boys were found dead in bed in the morning, after having gone to bed apparently in good health on the previous evening. *Group II* (pneumonia, 51 cases). The symptoms and duration were somewhat variable. *Group III* (febricula, 175 cases). The symptoms closely resembled the pneumonic cases, but evidence of lung consolidation was wanting.

The outbreaks occurred mostly in the colder seasons of the year, especially the spring. In respect of contagion, only the evidence afforded by the last epidemic (1911) was available, and this was negative.

Of fourteen cases examined post mortem in only one were the lungs normal. In the rest there was an acute general congestion or an irregular patchy pneumonia; in none was there a lobar pneumonia. In a few specially examined cases the mesenteric glands and glands of the intestines were enlarged. The spleen was also enlarged. In five cases the thymus, and in three the thyroid, was larger than normal. In eight cases in which a bacteriological examination was made, pneumococci were obtained from the lungs, and in some of the cases from the blood and other tissues. The boys in the school were found, as regards nutrition and development, to be considerably below the average for similar ages of the general population; 19·5 per cent of them were subjects of a chronic granular or follicular conjunctivitis, and 41 per cent suffered from some form of conjunctivitis. Enlarged tonsils and adenoids were frequent. Von Pirquet's tuberculin reaction was positive in 39 per cent of the boys, as compared with 14 per cent in another school of a similar kind which was examined as a control; and the reactions were unusually intense.

In respect of the cause of the outbreak, the reporters say: "In the various conditions of environment the boys at Tranent are, in our opinion, unduly exposed to cold, both from their too scanty clothing in the cold seasons, and also in the lack of heating arrangements in the dormitories and passages of the institution. There is also an inadequate allowance of air space in the dormitories, which may, to some extent, be mitigated by the free ventilation which is maintained." They are inclined to attribute the rapidly fatal event in some of the cases to a concomitant condition of status lymphaticus; and they suggest that this may be the explanation of sudden and early death in the acute infectious diseases.

REFERENCE.—[1]*Edin. Med. Jour.* 1913, i, 201.

PNEUMOTHORAX, ARTIFICIAL. (*See also* LUNG, SURGERY OF.)

J. J. Perkins, M.B., F.R.C.P.

The method of treatment, described in previous volumes of the ANNUAL, of introducing gas into the pleural cavity in cases of *pulmonary tuberculosis*, has thoroughly established itself. Reports accumulate on all hands of the advantages which accrue; with increasing experience the dangers of the process have been eliminated and it has now passed beyond the experimental stage. To show the universal interest excited, it is enough to say that an International Pneumothorax Association has been formed. The idea is to bring about collapse of the lung, and produce in the case of pulmonary tuberculosis the absolute rest sought in treatment of tuberculous lesions in other parts of the body, which is so essential to cicatrization. By the collapse, stasis in the lymph-channels is secured, the spread of the disease is checked, and toxic absorption or auto-inoculation prevented. The final result is a profound fibrosis, and how well the objects sought are attained is shown by the fact that in the post-mortems that have been done in after years on successful cases not a single fresh tubercle is to be found in the side which has been compressed (Rist).

ACCIDENTS.—In the past most of these resulted from the ignorance of the operator as to the exact position of the point of the trocar through which the gas is introduced. In some instances the end has lain not in the pleural cavity but in some vessel; the gas being then turned on, gas embolism of the cerebral circulation occurs with serious, and in several instances fatal, results. The use of a manometer attached to the trocar has removed this danger, and the operation only requires ordinary care to be perfectly safe. When the needle has really entered the pleural cavity, the negative pressure produced by the elasticity of the lung shows itself at once in the column of water in the manometer, and marked oscillations of the column corresponding to the changes in pressure brought about by inspiration and expiration are seen. If, on the other hand, the point of the needle lies in a vessel or has penetrated the lung, these evidences of negative pressure and respiratory movement are absent.

TECHNIQUE.—A trocar and cannula are joined up to a manometer and a reservoir of nitrogen, this gas being chosen because of its slow absorption by the pleura. A three way stopcock enables the operator to place his instrument in communication with the manometer or with the reservoir of nitrogen. The manometer is always in connection with the trocar and cannula until the operator is thoroughly satisfied that he has entered the pleural cavity. Then, and then only, he turns on the nitrogen, and after the gas has begun to run makes use of the manometric reading to show the pressure that he has brought about within the pleural cavity; as the gas flows in the reading of the manometer slowly changes from negative to positive.

Two methods of reaching the pleural cavity have been devised. In one, a comparatively free incision is made through the skin and subcutaneous tissues and the muscles are separated by some blunt instrument until the parietal pleura is exposed. The advantages of this method are that the operator can tell exactly when his trocar and cannula are entering the pleural cavity, and that he can see beforehand by the movements through the thin parietal pleura, whether the spot that he has chosen is free from the pleural adhesions which, by defeating his efforts to collapse the lung, are the *bête noire* of the operation. On the other hand, beside difficulties which it is not necessary to mention, surgical emphysema is rather apt to ensue, and whatever the importance of this inconvenience, the operator cannot repeat his incision *ad libitum*, so that to a considerable extent his hands are tied if his original site of operation is unsuccessful. The second method of reaching the pleura by merely pushing the trocar and cannula through the chest wall, as in ordinary aspiration of a pleural effusion, is free from these disabilities, and is apparently coming into almost general use. Many operators make a small incision through the skin and then push a cannula with a blunt trocar through the muscles until a sudden yielding and loss of resistance show that they have entered the pleural cavity. In this way all danger of puncturing a vein is removed. Whichever method is employed, however, it must be insisted that the only true criterion of the entrance of the instrument into the pleural cavity is to be found in movements of the manometer.

The choice of site for operation will be determined by the absence of pleural adhesions, and every effort must be made to decide this point, though after the closest investigation their presence or absence often remains problematical. It is hardly necessary to insist upon the importance of this point, as it is self-evident that an operation which seeks to separate the two pleural surfaces widely from one another by the introduction of gas, and so to collapse the lung, must be impossible if these surfaces are firmly bound together by strong adhesions. A spot therefore, usually in the lower part of the thorax, where the percussion note is resonant and the breath sounds are strong and free from evidence of disease, is chosen; to make certain as far as possible the best procedure employs the x-rays in addition, and endeavours to search out not only the condition of the lung at the selected spot, but also the degree of movement of the lower border of the lung, which is of course more free to move in the absence of extensive adhesions. Even with all these precautions, however, it is evidently impossible to make certain of the presence or absence of adhesions until trial has been made. The patient is placed upon the opposite side, with a pillow beneath him to effect the greater separation of the ribs; a hypodermic injection of morphia gr. $\frac{1}{6}$ to $\frac{1}{4}$ (Maxon King) may be given and 1 or 2 per cent solution of novocain is injected, at first beneath the skin, then into the deeper tissues, and finally by many into the pleural sac itself, with the object of reducing the possibility of the symptoms known as "pleural reflex," i.e., syncope, which may be fatal, and which occasionally has been known to follow the aspiration of the chest for fluid. In the earlier days of attempted artificial pneumothorax, a number of cases with symptoms of a dangerous syncopal nature were observed on the introduction of the trocar and cannula. The origin of these symptoms has been much debated, some ascribing them to pleural reflex, others to gas embolism in minute veins; but Forlanini has shown experimentally that symptoms of this nature may be avoided if the pleura itself is anæsthetized before the introduction of the trocar and cannula. The skin must be previously sterilized by the iodine method; ethyl chloride may be employed to anæsthetize the skin itself, though this seems hardly necessary. The trocar and cannula are then introduced, the sharp stilette is changed for a blunt one, and when the manometer shows that the instrument lies in the pleura and that adhesions are absent, the gas is turned on.

The presence of adhesions, as stated, is shown by the absence of the usual negative pressure and wide respiratory oscillations, or by the fact that after the introduction of a small quantity of gas the pressure becomes positive, and highly so if the introduction of gas is persisted in. Many excellent cases are reported of a gradual stretching and breaking down of adhesions by the repeated introduction of gas until almost complete collapse of the lung is attained, but such a procedure is, of course, not devoid of danger, and is rather for the expert. A golden rule for the novice, which will relieve him of danger and anxiety is only to introduce gas when the manometer shows him that he has entered the pleural cavity at a spot where it is free from adhesions. If he is unsuccessful in his first attempt, let him try some other spot, where he may be more successful.

Some difference of practice exists as to the amount of gas which should be introduced at the first attempt after the open pleural cavity has been struck. Some advocate small quantities, others larger, from the convenience thus gained in the subsequent refilling of the pleural cavity, which has to be frequently performed. Five or six hundred c.c. of gas seems to be a reasonable figure; and as regards pressure, Rist (whose paper is largely followed in this article) and many others are content with a slight positive pressure as shown on the manometer + 2 to 4 cm. of water, which is sufficient to keep the lung perfectly compressed. All are agreed as to the necessity of allowing the gas to run in slowly; a rapid inrush or a high positive pressure has been known not only seriously to inconvenience the patient, but to cause the ejection of the contents of a cavity in the lung followed by aspiration into, and infection of, the opposite lung.

The nitrogen introduced is rapidly absorbed from the pleura, so much so that at first fresh gas has to be introduced at the end of a day or two. Subsequently the absorptive power of the pleura lessens, and refills are only needed at longer intervals. These refills are done by means of a hollow needle—the pleural surfaces now being separated,—pushed through the chest wall, but under the guidance of the indispensable manometer. Gradually, as the lung is more or less completely compressed, the amount of gas can be increased, and it must be remembered that the object of the whole procedure is to compress and immobilize the lung as completely as possible and keep up a small positive pressure in the pleura. All are agreed that the constant use of the x-rays is the only means of determining the position of the gas and the condition of the lung, i.e., in what condition of compression it is. If the interval between the refills is allowed to become too long, too much of the gas is absorbed, and the lung begins to expand and regains a certain degree of movement, which is fatal to the success of the treatment.

RESULTS.—After some time the interval between the refills is quite a long one, e.g., a month, and though the patients are of course kept at rest at first, they can walk later on, and, indeed, perform light work. Nothing is more striking than the absence of the distress one would have expected to follow the presence of such large quantities of gas in the pleural cavity. A most marked amelioration of symptoms follows successful artificial pneumothorax, the temperature falls, the sputum lessens, the night sweats disappear, the appetite and general health strikingly improve, and a bedridden hopeless invalid has often been restored to active life. Though it may sound incredible, it is a fact that severe laryngeal tuberculosis not only is no bar to the procedure, but is strikingly benefited from the cessation of cough and the improvement in the general health (Vere Pearson).

In about 50 per cent of the cases, artificial pneumothorax is followed by the advent of a pleural effusion, which may or may not be accompanied by fever. It rarely requires tapping, and usually serves the purpose of diminishing the necessity for further injection of gas. If the pressure becomes too great, some of the fluid may be removed. Its formation is shown by the presence of a succussion splash and by the x-rays, dullness on percussion naturally not being obtainable until the effusion has become quite considerable. The effusion remains serous almost without exception. The nature of this complication has been much discussed, and various views have been advanced, but Kist seems to have shown by inoculation experiments that it is tuberculous.

The effects of the prolonged compression of a tuberculous lung have been seen in cases which have come to post mortem in after years. They are quite extraordinary, and may be summed up as extreme and extensive connective-tissue proliferation both in the lung and the subpleural layer. Even a cavity may be obliterated and converted into a firm scar. Of course, one must not expect from results like these a complete re-expansion of the lung, but it becomes a very good working lung, and, the chest wall falling in, the pneumothorax can after a time be abolished. This is done by the simple process of allowing the gas to be absorbed without further introduction. When to allow this is a matter for nice judgment, but Forlanini expresses the opinion (Rist) that one should in no case wait for less than one to two years.

Not many statistics have, of course, yet been gathered as to the remote results of the treatment as regards duration of the recovery. Spengler, however, has reported a series of 15 cases in which the pneumothorax had been ended for at least nine months, all of them originally severe cases with fever, abundant bacilli in the sputum, and, in eight, cavities. At the time of publication they had all been without fever, without expectoration, and fully able to work for more than a year (Rist). This is not to mention his cases in which the pneumothorax still existed, however striking their recovery.

SELECTION OF CASES.—Hitherto the cases selected have been those which have not responded to other modes of treatment. As these have done so well, it is only natural to suppose that early cases would do even better with this mode of treatment; but as the early case as a rule responds well to other methods, it is probably wise to follow Maxon King and reserve artificial pneumothorax for comparatively unfavourable cases. Forlanini himself (Maxon King) considers the following as indications for treatment by induced pneumothorax: (1) Uncomplicated unilateral phthisis with slow or subacute course, without regard to the degree of the lesion. (2) Bilateral phthisis not running an acute course and with lesions on both sides, but not far advanced. To these may be added acute progressive tuberculosis of one lung. The condition of the other lung, except in very severe or desperate cases, is the criterion for interference. This for obvious reasons must not show advanced disease; but it is interesting to note that a pneumothorax promotes the healing of an apical lesion on the untouched opposite side, so that early disease on that side is no contra-indication. Quite a number of advanced and extensive cases, it is true, have received extraordinary and unhoped-for benefit, but of course such cases stand on their own merits and are outside the ordinary rules. Acute miliary tuberculosis must be excluded, and so must abscess of the lung; laryngeal tuberculosis is no bar, but intestinal ulceration is excluded by all.

REFERENCES.—Rist, *Quart. Jour. Med.* 1913, Jan. 259; Maxon King and Mills, *Amer. Jour. Med. Sci.* 1913, ii, 330; Claude Lillingston, *Lancet*, 1913, ii, 796; *Ibid.* 1912, ii, 1642; Parry Morgan, *Ibid.* 1913, ii, 18; Hamman and Sloan, *Johns Hop. Hosp. Bull.* 1913, 53; Balboni, *Bost. Med. and Surg. Jour.* 1912, ii, 755; Mary E. Lapham, *Amer. Jour. Med. Sci.* 1912, i, 503; Dunham and Rockhill, *Jour. Amer. Med. Assoc.* ii, 826, 1913.

POLIOMYELITIS, EPIDEMIC.

Purves Stewart, M.D., F.R.C.P.

Etiology.—Repeated observations in recent years on the subject of poliomyelitis have placed its infective origin beyond doubt, and the brilliant investigations of numerous workers, especially of Flexner and his pupils (see Medical Annual, 1912 and 1913), have succeeded in identifying the virus, and in reproducing the disease experimentally in monkeys. McIntosh and Turnbull[1] have confirmed these observations by inoculation in monkeys in London; but the English virus, unlike the American or Continental strain, has not yet produced a fatal disease in monkeys.

The *mode of transmission* of poliomyelitis is an important problem, since in this, prevention is not only better than the most perfect means of cure, but specially important, since at present we possess no true curative or specific treatment for the established disease; and because, for the most part, by the time the disease is recognized in the human subject it has already caused irreparable damage.

It is now well known that the virus of poliomyelitis occurs not only in the spinal cord and brain, but also in the mesenteric lymph glands and in the mucous membranes of the nose, pharynx, and gastro-intestinal canal, and in their mucous secretions. The distribution of the virus in experimentally infected monkeys is the same as in spontaneously infected human beings. The virus, until recently, was not known to be capable of cultivation apart from the infected monkey or patient, and the only certain means of identifying it has been by its transmission to monkeys. Recently, however, Flexner and Noguchi[2] made fresh efforts at cultivation, and succeeded in growing colonies of "globoid bodies" under anaerobic conditions in culture media consisting either of sterile ascitic fluid, or of brain extract to which fragments of sterile rabbit kidney and a layer of paraffin oil had been added. From each of these a second medium was made by adding nutrient agar-agar in the proportion of 1 to 2. The first media permit of a slow growth not visible to the naked eye, whilst the second (which are unsuitable for obtaining the initial growth) yield visible minute colonies clouding the tubes. The cultivated globoid bodies occur in various arrangements—single, double, short chains, and masses—and stain a pale reddish violet in Giemsa's solution. Similarly stained bodies have also been demonstrated by Noguchi in films prepared directly from the nervous tissues of infected animals. Monkeys have been inoculated with these cultures through several generations, and all the typical phenomena of poliomyelitis have been reproduced.

The virus in man must enter the body by some external channel, and it is highly probable that it does so through the uninjured nasal mucous membrane, and that this is the site both of its ingress and egress. Clinical evidence points strongly to the fact that human virus-carriers exist, and that these carriers, themselves healthy, may transfer the disease from one person to another. Corroboration of this view has been furnished by the Swedish investigators Kling, Pettersson, and Wernstedt,[3] who found the virus in the nasopharyngeal washings of patients, attendants, and friends; by Osgood and Lucas,[4] of Boston, who found it in a case two and a quarter years after the original infection; and by Flexner, Clark, and Fraser,[5] who found it in the parents of a child suffering from an acute attack of the disease. Facts like these suggest strongly that the disease is caused by contagion, despite the objections that it prevails more in rural than in urban conditions; that when it invades a city it is not specially frequent in the poorer or congested areas; and that cases of infantile paralysis admitted to hospitals have not yet been known to infect others in the same institution. The seasonal prevalence of the disease, which attains its maximum during the summer months, is capable of various explanations. Thus, it may be dust-borne; and Neustaedter and Thro[6] claim to have induced the disease in monkeys by inoculating them with the dust found in sick rooms. But poliomyelitis, as Rosenau[7] points out, does not show the common characteristics of a dust-borne disease, so that this hypothesis has been given scant practical attention. Another possibility is, that it is insect-borne, the house-fly being a possible contaminator, since, as shown by Howard and Clark, the virus survives on the surface of the body of these insects and within their gastro-intestinal tract.

In view of these various possibilities, the duty of the physician and of the medical officer of health is to face and combat all of them, and not to neglect any reasonable route of infection. Fortunately, the spread of epidemics is limited by the fact that in many individuals of all ages there is a natural insusceptibility to the disease.

The *symptoms* of the disease in the human subject are too familiar to require detailed description. Suffice it to remind the practitioner of its febrile onset with flaccid paralysis of limbs and trunk, often widespread and asymmetrical, and associated with pains in the limbs, but without anaesthesia or sphincter trouble. The paralysis recovers more or less completely after a few days, leaving a residue of permanent paralysis and atrophy in certain muscle-groups. The cerebrospinal fluid in the early days of the disease shows an abundant pleocytosis of the mononuclear type.

Colliver,[8] of Los Angeles, during a recent epidemic of poliomyelitis, in which he observed sixteen cases, described a symptom which he regards as pathognomonic of the pre-paralytic stage of the disease. It consists of a peculiar tremulous twitching of certain groups of muscles of the limbs, face, and jaw, sometimes localized, sometimes all over the body. These tremors last only a second, but as the case progresses they may last several seconds, or even a minute, recurring at frequent intervals. Sometimes the twitch is accompanied by a peculiar hydrocephalic cry. The twitching resembles in some respects that of strychnine poisoning, since it is elicited or aggravated by slight stimuli, tactile or auditory.

REFERENCES.—[1]*Lancet*, 1913, i, 512; [2]*Jour. Amer. Med. Assoc.* 1913, i, 512; [3]*Trans. XVth Internat. Congr. on Hyg. and Demogr.* Washington, 1912; [4]*Jour. Amer. Med. Assoc.* 1913, i, 1611; [5]*Ibid.* 201; [6]*Ibid*, 1615; [7]*Ibid.*; [8]*Ibid.* 813.

POLYCYTHÆMIA.

Herbert French, M.D., F.R.C.P.

Erythræmia (Splenomegalic Polycythæmia).—Details of six fresh cases of erythræmia from the London Hospital are published by Parkinson[1] and amongst the points which he brings out is the fact that the spleen in these cases may ultimately become no longer palpable, though at a previous stage it may have been large. The symptoms usually appear in adults between the ages of thirty and sixty, and rather more frequently in men than in women. Shortness of breath, blueness, giddiness, and general weakness are among the earliest and most constant complaints. In some patients the first symptoms are referable to the spleen, and consist of abdominal pains, usually on the left side. Others complain of the presence of an abdominal tumour. The change in facial appearance may not have been noticed by the patient. Wasting and general weakness are frequent, but only severe when the other symptoms are also troublesome. The subjects of erythræmia are very liable to hæmorrhages. Epistaxis, bleeding from the gums, and hæmatemesis have often been remarked. Purpura occurred in two of the cases here described. Headache occurs at some time during the course of most cases. It often becomes continuous, and produces a feeling of pressure or fullness whenever there is an exacerbation of the general symptoms. Typical attacks of migraine are sometimes a feature. The giddiness of erythræmia comes on in brief attacks; tinnitus is rare. Paræsthesiæ, such as tingling or numbness, may be felt in the arms and legs or over the whole body. Muscular spasms, twitchings, and cramping pains may affect the extremities. Mental changes, such as nervousness, excitement, and loss of memory, sometimes appear. Graver cerebral symptoms suggest cerebral thrombosis or hæmorrhage. Temporary disturbances of vision are not infrequent. It is unusual for cardio-vascular symptoms to predominate, but palpitation is common. Coldness of the extremities may be found, and a few patients have suffered severe neuralgic pains in them. Œdema of the legs is sometimes present, especially late in the disease. Thromboses of vessels in any part of the body may give rise to local symptoms. Shortness of breath almost invariably forms one of the patient's complaints, yet the objective distress is often slight. Vomiting occurs in many cases, and is associated with anorexia, pain after food, and constipation. Severe attacks of sweating are described.

The *microscopical* characters of the tissues post mortem are described by Wakasugi.[2]

Chauffard and Troisier[3] record a case of erythræmia complicated by ascites and gastro-epiploic thrombosis resulting in enormous varicosity of the superficial veins of the abdomen and thorax, similar to that which is seen sometimes in connection with malignant disease within the abdomen.

The fact that erythræmia is by no means uncommonly associated with arteriosclerosis and high blood-pressure is insisted on by Monro and Teacher.[4] They classify types of polycythæmia as follows:—(1) Relative: due to concentration of the blood, as in cases of severe diarrhœa or profuse sweating; (2) Absolute: due to excessive erythroblastic activity of the bone-marrow.

True polycythæmia may be either (*a*) Symptomatic or secondary: met with in cases of chronic cyanosis associated with heart or lung disease, and also in man and other animals living at high altitudes; or (*b*) Primary polycythæmia or erythræmia: analogous to leukæmia, and known by a variety of names, including "Vaquez's disease," "Osler's disease," "splenomegalic polycythæmia," "myelopathic polycythæmia," "polycythæmia with chronic cyanosis," and "erythrocytosis megalosplenica."

The prognostic significance of secondary polycythæmia in cardiopulmonary cases has been studied by Parkes Weber,[5] who finds that the occurrence of polycythæmia in chronic bronchitic and other similar cases is a bad sign, and an indication of the approaching end, even when the disease itself may appear to be less severe than it has been. The red corpuscles under these conditions often rise to 6, 7, or even 8 million per c.mm

REFERENCES.—[1]*Lancet* 1912, ii, 1425; [2]*Deut. med. Woch.* 1912, 2217; [3]*Presse Méd* 1913, 653; [4]*Lancet* 1913, i, 1015; [5]*Ibid.* 1307.

PREGNANCY, DIAGNOSIS OF. (*See also* BLOOD, EXAMINATION OF.)

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

Abderhalden[1] has introduced a method of diagnosing pregnancy in the laboratory by means of *biochemical tests*, which depend upon the fact that in pregnancy microscopic portions of chorionic villi pass into the maternal blood, protective ferments being developed in the blood as a result. These ferments cause cleavage in human placental albumin and convert it into peptone and amino-acids. He states that they appear as early as six weeks from the date of the last menstrual period, and continue until fifteen days after the end of pregnancy.

The following are the two methods of testing the serum:

1. *Optical Method.*—This is the more difficult of the two. One c.c. of the serum to be tested is placed in a polariscope tube with 1 c.c. of a 5 per cent solution of placental peptone in normal saline. The tube is surrounded by a water-bath at 37° C. The initial rotation is read, and the tube placed in an incubator at 37° C. for forty-eight hours. It is taken out at four-hourly intervals and the rotation read. A change of 0·05° or more is considered significant of the presence of ferments and positive in the diagnosis of pregnancy.

2. *Dialysation Method.*—For this test a fresh placenta is taken and carefully washed and boiled, to free it from blood and dialysable substances. One gram of placental albumin, after being teased into minute pieces, is placed in the dialyser, and 1·5 c.c. of the serum to be tested is added. The dialysers are parchment capsules prepared by Shleicher and Schull (No. 579A), which allow peptones and amino-acids to pass through, but not serum and placental albumin. The dialyser and its contents are placed in a container containing 20 c.c. of distilled

water. A large glass test tube makes an excellent container, the top of which is plugged with sterile cotton-wool and placed in an incubator at 37° C. for sixteen hours. At the end of this period of incubation the dialysate is tested for amino-acids and peptones by a 1 per cent solution of ninhydrin, a substance which will detect minute amounts of peptones and amino-acids; and if they are present a blue or purple colour will be given when the ninhydrin is added to boiling dialysate.

The test is a very complicated one, and can only be carried out by those constantly in touch with modern laboratory methods. The possible sources of error are: (1) In the preparation of the placental albumin which *must* be free from blood and dialysable substances, and must be tested frequently to show this; (2) The dialysers, which must be tested with peptones and albumin before the test is made; (3) If the serum is taken from a patient while digestion is in process, it may possibly contain enough amino-acids to give a positive reaction without the addition of placental albumin. This would be noticed in the controls to the actual test.

Schlimpert and Hendry[2] have reported 79 cases which they have tested with very careful technique by Abderhalden's method. Thirty-nine non-pregnant cases all gave a negative reaction. Forty were pregnant, and in all these the reaction was positive at the following dates: one to three months, 8 cases, the earliest of which was four days after cessation of menstruation; four to six months, 2 cases; seven to ten months, 18 cases; during labour, 2 cases; during the lying-in, 10 cases. The latest date in the puerperal cases was one which gave a faint reaction on the thirteenth day after labour.

Gutman and Druskin[3] give their experiences of the test in 100 cases, of which 21 were non-pregnant and 79 were pregnant. Of the 21 non-pregnant cases 20 gave a negative result and 1 was positive. Of the 79 pregnant cases 78 gave positive results and 1 was negative.

Stange[4] examined 78 cases, and obtained correct results in all—75 pregnant cases giving positive and 3 non-pregnant cases negative results.

Jaworski and Szymanowski[5] have examined 70 cases, with positive results in all the 35 cases of uterine pregnancy examined. They also obtained positive results in puerperal cases up to the fourteenth day after labour. The results were positive in three cases of extra-uterine gestation; and negative in puerperal cases after the fourteenth day, in three cases of old pelvic hæmatocele, and in all cases which were afterwards proved not to be pregnant.

Schiff[6] has tested a series of 49 cases. He obtained positive results in 33, only 31 of which were pregnant, the two incorrect ones being a case of bleeding at the menopause and one of myoma of the uterus; in both these the blood had hæmolysed before separation of the serum. He obtained negative results in 16 cases, all of which were correct. The earliest pregnancy in which he obtained a positive reaction was fourteen days after cessation of the menstrual period.

Ekler[7] examined 12 cases, in all of which he obtained correct results. Five cases, two of pregnancy and three of retained placenta gave a positive reaction, the rest being negative.

Mensuration.—Spalding[8] considers that abdominal measurements are of value in estimating the degree of maturity of the unborn child; and that it is possible to estimate with considerable accuracy the probable week of pregnancy from accurate measurements of the height of the fundus above the symphysis taken with a tape measure.

McDonald[9] also describes a similar method. He measures with a centimetre tape applied to the abdominal wall, and finds that 35 cm. is the usual height at full term, and that it grows in height 3·5 cm. every lunar month. He makes the following rule: The duration of pregnancy in lunar months equals the height of the uterus in centimetres divided by 3·5.

REFERENCES.—[1]*Deut. med. Woch.* 1912, 2100; [2]*Münch. med. Woch.* 1913, 681; [3]*Med. Rec.* 1913, ii, 99; [4]*Münch. med. Woch.* 1913, 1084; [5]*Wien. klin. Woch.* 1913, 922; [6]*Münch. med. Woch.* 1913, 1197; [7]*Wien. klin. Woch.* 1913, 690; [8]*Jour. Amer. Med. Assoc.* 1913, ii, 740; [9]*Amer. Med.* 1913, i, 220.

PREGNANCY, ECTOPIC.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
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Huffman[1] draws attention to the frequent occurrence of some abnormality of the Fallopian tube, e.g., accessory tubes, accessory ostia, small cysts at the abdominal ostia, etc., in cases of tubal pregnancy. From the study, both macroscopic and microscopic, of many specimens, he considers that there is ample support for the theory that ectopic pregnancy is caused by imbedding areas being present in different situations through mal-development of the Mullerian duct. Normally the imbedding area is in the uterus only.

Green[2] advises **Direct Blood Transfusion** in the treatment of severe cases of extra-uterine gestation. He thinks that it may be used with advantage as soon as the hæmorrhage is stopped, and while the patient is still under anæsthesia. He uses the radial artery of the donor of the blood, and the median basilic vein of the patient, connecting them by an Elsberg cannula. Cobb[3] has studied 137 cases, and concludes that **Immediate Operation** is the best treatment, delay of any kind, even for transfusion, being unjustifiable and dangerous. With proper technique, and the use of intravenous saline solution, the operation mortality will be very low.

REFERENCES.—[1]*Surg. Gyn. and Obst.* 1913, i, 548; [2]*Bost. Med. and Surg. Jour.* 1913, i, 270; [3]*Ann. Surg.* 1912, ii, 835.

PREGNANCY, SYPHILIS AND. (*See* SYPHILIS.)

PREGNANCY, TOXÆMIAS OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

Albuminuria.—Williamson[1] thinks we are justified in concluding that a condition of acidosis is constantly found in pregnancy toxæmia of a severe type, but not in cases of chronic nephritis, even when the symptoms are severe; also that the onset of acidosis in a case of chronic nephritis with pregnancy means that toxæmia has been added to the existing lesions. In pregnancy toxæmia, chloroform should never be administered, because its action is to render the existing lesions more grave and to increase the acidosis. Ether given by the open method is the safest anæsthetic. Calomel as an aperient, and vaginal douches of mercurial antiseptics, should be avoided, as the lesions in the liver and kidneys in mercurial poisoning are of the same nature as those of pregnancy toxæmia; and it is probable that mercury in small doses will increase the gravity of the lesions already existing. In all cases where an acidosis is present, intravenous infusion of a solution of **Sodium Bicarbonate** or **Sodium Acetate** should be practised. Glucose given in solution by the mouth or rectum is valuable in preventing excessive fat metabolism. When a pregnant woman with chronic nephritis shows signs of acidosis, the **Uterus** should be emptied without delay, for with a previously damaged kidney the prognosis of pregnancy toxæmia is very grave.

Vomiting of Pregnancy.—Sergent and Lian[2] consider that the ordinary vomiting of pregnancy is a "villo-toxæmia," that pernicious vomiting is due to insufficient suprarenal secretion. They quote six cases in which immediate and marked improvement followed treatment by **Suprarenal Extract** or **Adrenalin** after all other therapeutic measures had failed. They think that pregnancy should never be ended for pernicious vomiting until a trial has been given to this method.

Whitridge Williams[3] divides the vomiting of pregnancy into three classes—neurotic, toxæmic, and reflex, of which the neurotic is the most and the reflex the least frequent type, while the toxæmic is the most serious. He thinks that the underlying factor in all cases is probably an imperfect reaction on the part of the mother to the growing ovum; in most cases this is only a predisposing cause, and the exciting factor is a reflex or neurotic influence, removal of which brings cure. He considers that the significance of a high ammonia coefficient is not specific; it may be a manifestation of toxæmic vomiting, of starvation following neurotic vomiting, or of an acidosis due to any cause. It should be regarded as a danger signal, while the differentiation between the various types can only be made after careful clinical observation. If improvement does not promptly follow appropriate treatment, the existence of toxæmic vomiting should be assumed and abortion immediately induced. The best method of emptying the uterus in primigravidæ, and the one which causes least shock, is **Vaginal Hysterotomy**, in Williams' opinion. Nitrous oxide gas or ether should be used in preference to chloroform for anæsthesia.

Eclampsia.—Haultain[4] gives the history of seven cases treated by **Veratrone** (a Parke Davis preparation of the alkaloids of veratrum viride for subcutaneous injection). Four cases were in primigravidæ, all of whom recovered; three were multiparæ, one of whom died, one recovered but became maniacal, while the third recovered. This last case was of considerable interest, in that she was only six months pregnant, and after treatment pregnancy went on normally to full term. The dose is 1 c.c. injected subcutaneously. The results were noticeable as soon as five minutes after the injection; they consist of marked lowering of the blood-pressure and slowing of the pulse. If the pressure rises again, another injection should be given. The author advises a further trial of this remedy, which is only empirical.

Coughlin[5] describes the treatment of eclampsia in three cases by **Veratrum Viride**, which he considers a very valuable drug. It may be given by hypodermic injection or by the mouth, the former method being preferable. Its action is to lower the pulse-rate and tension, and to control the convulsions. He advises that this treatment be combined with rapid delivery whenever possible.

Wallace[6] describes the treatment of the convulsion in two cases of eclampsia by intrathecal injections of a 25 per cent solution of **Magnesium Sulphate.** The amount injected depends on the weight of the patient, 1 c.c. being allowed to every 25 lb. of body weight. The points noticed were the freedom from convulsions after the injection, in one case for seven hours and the other for four hours, seven and six fits respectively having occurred prior to the injection; and both women had living children, the second case being a severe one where a live child would not have been expected unless the convulsions had been stopped by some means.

Halliday Croom[7] considers **Cæsarean Section** to be the most satisfactory method of rapid delivery; if labour is in progress and the cervix slightly dilated, he considers the vaginal the better route, and advises that delivery be completed by version rather than by forceps. If labour has not started and pregnancy is near term, he prefers the abdominal route, which is no more dangerous in suitable surroundings. For post-partum eclampsia when all methods of treatment fail, the fits continue, and the patient is in great danger, he strongly recommends **Decapsulation of the Kidneys.**

Peterson[8] advocates **Emptying the Uterus** as the best treatment of eclampsia. He has examined the records of a large number of cases, and finds that of 615 treated by prompt delivery the maternal mortality was 15·0 per cent, while in 300 treated expectantly it was 28·0 per cent. He considers that when the uterus is emptied immediately or very soon after the first convulsion, the maternal mortality is still lower. He advises the operative procedure which will empty the uterus in the quickest time, with least trauma and shock to the mother, i.e., Cæsarean section.

Shears[9] claims to have obtained good results by treating cases of toxæmia in pregnancy by free use of **Oxygen**, either by inhalation or subcutaneously. He gives no detailed results.

Dermatitis.—Wolff[10] records the case of a woman suffering from pruritus and dermatitis during pregnancy, which he treated by intravenous injection of 8 c.c. of the patient's serum which had previously been inactivated. The irritation improved considerably, and some of the rash disappeared; but the patient had a relapse, which he treated by intramuscular injection of 10 c.c. of serum obtained from a healthy patient fourteen days after labour. The serum was inactivated before injection. The result was very marked, and in four days all irritation had completely disappeared.

REFERENCES.—[1]*Lancet*, 1913, i, 1365; [2]*Presse Méd.* 1912, 1033; [3]*Glasg. Med. Jour.* 1912, ii, 401; [4]*Edin. Med. Jour.* 1913, i, 313; [5]*Med. Rec.* 1912, ii, 386; [6]*Lancet*, 1912, ii, 1574; [7]*Med. Press and Circ.* 1913, i, 114; [8]*Amer. Jour. Obst.* 1913, ii, 291; [9]*Med. Rec.* 1913, i, 66; [10]*Berl. klin. Woch.* 1913, 1001.

PROSTATE, DISEASES OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Simple Enlargement.—Cuthbert Wallace[1] discusses some conditions simulating prostatic hypertrophy. Prostatic symptoms may be produced by enlargement of the organ which is difficult to detect until the bladder is opened and a bimanual examination made. Antero-posterior angling of the prostatic urethra in middle-aged and old men, without enlargement, may cause obstruction. The following conditions have been described as giving rise to symptoms imitating those of prostatic enlargement: (1) Induration of the internal meatus; (2) Primary atony of the bladder muscle; (3) Secondary failure of the muscle due to inflammation; (4) Fibrosis of the muscle due to old age; (5) Want of correlation between the sphincter and the detrusor; (6) A loss of sensibility of the mucous membrane; (7) Chronic prostatitis and post-urethral bar formation; (8) Atrophy of the prostate; (9) Perverted prostatic secretion acting on the bladder; (10) Failure of the extraspinal bladder centre. The author concludes that even when a bimanual examination discovers no enlargement, the cause of the trouble may still lie within the prostate. No error of micturition should be assigned to a failure of nerve or muscle until all mechanical defects have been excluded. Bending of the prostatic urethra is the cause of the difficult micturition in some cases, which can be cured by a simple operation.

H. Cabot[2] favours the view that the pathological condition in simple enlargement of the prostate is not a hypertrophy but the formation of adenomatous tissue arising in certain portions of the gland and replacing the normal tissue wholly or in part. He agrees with Lowsley's division of the prostate into a posterior, a median, and two lateral lobes, with the occasional persistence of an anterior lobe, and the frequent occurrence of detached groups of glands such as the subcervical group. The adenomatous masses arise from the median and lateral lobes, occasionally from the subcervical glands and a persistent anterior lobe. There is no evidence that they ever arise from the posterior lobe. The masses occupying the lateral lobes are covered posteriorly by the posterior lobe, and do not here come in contact with the capsule. Laterally they lie against the true capsule or sheath of the prostate. Superiorly they abut upon the median lobe, and in the absence of its development upon the muscular structures of the bladder neck. Mesially they are covered only by mucous membrane and by the stretched and atrophied capsule of the prostate, from which they cannot be separated by dissection. The mass arising from the median lobe is covered posteriorly by the posterior lobe. In the operation of enucleation the adenomatous masses in the lateral and median lobes are shelled out from the capsule of the prostate on the side, from the muscular structure of the bladder neck above, and from the posterior lobe, the old so called surgical capsule, below. The perineal operation described by Young is termed conservative, the object being to preserve the ejaculatory ducts and avoid injury to the "structures involved in the nervous mechanisms pertaining to potency." If the lobes are truly enucleated, as Young states, the mucous membrane of the urethra must also be removed, as it cannot be dissected off the lobes even outside the body. What does take place is the enucleation of greater or smaller portions of these lateral and median masses from within the masses themselves, the amount of adenoma left behind depending upon the lines of cleavage within the mass and the experience and dexterity of the operator. The adenomatous tissue left behind reproduces more or less exactly the form of the obstructing tumour present before the operation, and it remains largely a matter of accident whether the relief to the patient is large or small. The avoidance of the ejaculatory ducts is extremely problematical. Having regard only for the functional results, Cabot believes that the **Suprapubic** route is far superior. By this method it can be declared with certainty that if the patient survives the operation the function of the bladder will be restored practically to normal. By the perineal method, muscular control is jeopardized, particularly in the case of large masses ; and a certain number of cases of incontinence, more or less partial, are almost certain to follow. Fistulæ of various kinds occasionally result, those communicating with the bowel being the least common but the most serious.

E. S. Judd[3] also prefers the suprapubic to the perineal route, and advocates careful preparation of the patient before operating. The first step is to relieve him of the residual urine, and treat cystitis if it exists. The urine retained in the bladder should be withdrawn gradually, keeping it empty for a longer period each day until no bad effects are apparent. In many instances it will require several weeks to carry this out. In about three-fourths of the cases the requisite drainage has been accomplished by a permanent catheter introduced into the bladder through the urethra. In the remaining fourth it was necessary to make a preliminary suprapubic stab-drain, because introduction of a catheter was impossible or uncomfortable. The second step consisted in the removal of the prostate. According to this author, the chief disadvantage of the suprapubic method is the length of time required for the urinary fistula to heal, owing to infection of the suprapubic space. "It has not been uncommon to see these cases drain for weeks or even months, or terminate badly on account of extensive infection." On this account he closes the wound in the bladder completely and ties a catheter in the urethra, or introduces a small tube at the upper end of the suprapubic wound. In the first case, a two-way catheter is used, with constant irrigation, for twenty-four hours, or a single bore catheter is used, and a nurse syringes the bladder every few minutes.

A. E. Rockey[1] also supports the suprapubic route, and uses *spinal anæsthesia* with stovain. He has totally abandoned irrigation at and after operation. After enucleation of the gland, the author stitches the bladder to the muscle and fascia of the abdominal wall so that "the bladder wall is suspended against the abdominal wall in such a manner that the edges of the vesical incision turn inward, giving a valve which much facilitates subsequent healing." He uses a drainage tube of ½ in. diameter, believing that very large tubes are unnecessary.

P. J. Freyer[2] reviews his experience in suprapubic prostatectomy to the end of 1912. There were 1030 cases, the age varying from 49 to 90 years, with an average of 69¼ years. The prostates removed ranged from ½ to 17 oz. in weight. There were 57 deaths or 5½ per cent. In one case the bladder remained flaccid after the operation, and "seems to have been completely paralyzed by the extreme over-distention by the urine before the catheter was employed." The mortality has gradually diminished from about 10 per cent to a little over 4½ per cent in the last 400 cases. In 190 cases, stones, usually phosphatic, were present in the bladder. Among these there were 16 deaths, or 8·42 per cent—nearly double that in the cases uncomplicated with stone. In 55 cases, Fullerton's[3] mortality was 7·2 per cent. The most serious complications and sequelæ were hæmorrhage, shock, hypostatic congestion of the lungs, sepsis, epididymitis, suprapubic fistula, phosphatic deposit on the suprapubic wound, stone in the bladder, uræmia, stricture of the urethra, incontinence of urine, perirenal abscess, hæmatemesis, ventral hernia, and mental symptoms.

Wilms[4] describes his method of **Perineal Prostatectomy** with lateral incision. He employs either local or spinal anæsthesia, using novocain for the latter after injecting 20 c.c. of normal saline with 4 or 5 drops of adrenalin in order to hinder its rapid distribution. The patient is placed in the lithotomy position, the bladder is filled, and Young's prostatic retractor introduced. The scrotum is drawn to one side, and an incision made parallel to the descending ramus of the pubic bone, extending forwards to within 1½ to 2 cm. of the symphysis. The skin and superficial fascia are cut through, and the point at which Young's retractor enters the prostate is searched for with the finger. This is very easily found, as it lies only about 2 cm. from the surface. Dressing forceps are pushed alongside the instrument through the prostatic capsule and the blades separated, so that an opening is made through which the finger passes, and the prostate gland is enucleated in similar manner to the suprapubic method. The left lobe is first separated, then the retractor is removed and the assistant presses suprapubically on the distended bladder while the right lobe is separated. Forceps are now introduced, and the gland is withdrawn, usually in a single mass.

Hartmann[5] records 43 cases of subtotal perineal prostatectomy, with 8 deaths and 35 cures. In 2 cases death was due to secondary hæmorrhage, and in 3 to pulmonary complications. Orchitis occurred in 10 cases, and rectoperineal fistula in 2. Late results were known in 27 cases. In 17 there were no urinary symptoms; in 2 there was either slight cystitis or incomplete retention. In transvesical prostatectomy Hartmann sutures the margin of the bladder wound to the muscle and fascia of the abdominal wall to avoid retraction of the bladder and urinary infiltration. In 53 cases there were 44 cures and 9 deaths, 1 due to spinal anaesthesia, 1 to anuria, 4 to pulmonary complications, 2 to urinary infiltration, and 1 to pyelonephritis. Late results were obtained in 29 cases; of these 24 were completely cured. The end results of transvesical prostatectomy were therefore better than those of perineal.

Small Prostatic Bars and Contracture of the Orifice.—Young[9] describes a new **Punch Operation.** The instrument consists of "an outer tube about 18 cm. long, with a coudé curve at its inner end and a urethroscopic disc at the other, containing a part on which an external urethroscopic light can be attached. Near the inner end on the under surface a large deep fenestra is provided. Within the instrument is a second tube with a sharp cutting inner end made of steel, which when pushed home can excise anything appearing inside the outer tube. The object of this instrument is, when pushed through the urethra into the bladder, to engage the median bar in the fenestra, and then to excise it by means of the inner cutting-tube, while observing the operation through the inner tube illuminated with the external urethroscopic lamp." One cut is usually not sufficient, and lateral cuts are made on each side. When the cutting inner tube is removed, the bladder is washed out through the outer tube until clear of clots. The obturator is introduced and the instrument withdrawn. A two-way catheter is then introduced into the bladder, and continuous irrigation kept up for twenty-four or forty-eight hours. Sometimes the tubes become plugged with clots, which have to be removed by a syringe. The author has performed the operation on 51 cases of simple bars or contracture of the prostatic orifice; median bar with diverticulum, 4 cases; bar with vesical calculus, 11; small lobe obstruction after prostatectomy, 20; small lobe with trigonal obstruction, 3; small bar associated with spinal disease, 4; obstruction associated with cancer of the bladder and prostate, 9. The immediate results, according to the author, were satisfactory in all cases. In a few trouble was experienced on account of plugging of the catheter with blood-clot, but in no case was the hæmorrhage alarming. The remote results, "even in cases of complete retention of urine and catheter life are **entirely satisfactory.**"

Cancer.—R. J. Willan[10] finds from a study of 33 cases that the average duration between the onset of symptoms and the first consultation with a surgeon was fourteen months and a half. The average age was 61. The onset symptom was increased nocturnal frequency of micturition in 40 per cent, and gradual obstruction to urination in 30 per cent. Pain was variable and not characteristic. Urinary obstruction was a marked feature, complete retention being present in 72 per cent and partial retention in 24 per cent. Hæmaturia was not common. On rectal examination, 70 per cent showed hard nodules with fixity of the gland. The average duration of the disease from onset of symptoms to death was twenty-eight months. The treatment recommended when there was no residual urine was the administration of a **Urinary Antiseptic** and **Opium** when necessary. If residual urine is present, **Catherization** should be commenced. If there is obstruction, or if catheter life is intolerable, permanent **Suprapubic Drainage** should be established.

Eugene Fuller[11] discards suprapubic enucleation as unsuitable for the great majority of cancer cases, and performs a combined suprapubic and perineal operation by which he removes a "boat-shaped" section of the growth. The patient is placed in the lithotomy position, and the left forefinger introduced into the rectum. A long-bladed, straight, blunt pointed bistoury is passed through the perineal opening along the prostatic urethra into the bladder. Guided by this finger the prostate is cut backwards towards the bowel in the middle line. The knife is turned to the right, and made to curve forward, cutting a wedge like one half of a boat out of the right side of the prostatic mass. It is then returned to the middle line and a similar wedge is cut out of the left side of the prostate. The operation is finished by cutting with scissors from the perineum, and drainage tubes are placed in both suprapubic and perineal wounds. The operation is not radical, but it relieves the prostatic obstruction and prolongs life.

Chronic Prostatitis.—Young[12] draws attention to the rôle of the prostate and seminal vesicles in *chronic toxæmias and remote infections.* Chronic prostatitis and seminal vesiculitis are extremely common diseases; they may exist without producing symptoms for years, and then show themselves as a danger seat when the patient marries or becomes the subject of chronic rheumatism. The original etiology of these cases is not always gonorrhœal. Many arise from descending bacterial infections, and the infection may also reach the prostate from the rectum as a result of proctitis, ulcer, hæmorrhoids, etc., but more commonly still from long continued masturbation. On rectal examination the prostate is very little enlarged. It is smooth and indurated, and may show slight irregularities, with adhesions to the rectum and pelvic wall. The seminal vesicles are usually affected similarly. The local symptoms are often slight, amounting to a slight fullness and discomfort. The nervous symptoms are often so remote that the prostate is not suspected. They may take the form of lumbago, sciatica, vague pains in the back, hips, thighs, perineum, groin, or soles of the feet. In operating on the prostate and seminal vesicles for this condition, Young uses the usual inverted V-shaped cutaneous incision in the perineum, and exposes the prostate as if for perineal prostatectomy. Next, instead of incising the membranous urethra, the long retractor is pushed down into the bladder, opened, and traction made; and the posterior surface of the prostate, and by further traction the seminal vesicles, are exposed. If the vesicle is surrounded by adhesions these are freed, and the vesicle either opened by one or more incisions or by removing a portion of its posterior surface. Resection and extensive incision are unnecessary and undesirable except in tuberculosis, where operation is usually contraindicated. The prostate is dealt with by incision or by excision of portions, depending on the extent of the disease, care being taken to preserve the floor of the urethra and ejaculatory ducts, and not to open the urethra. (*See also* SEMINAL VESICLES.)

REFERENCES.—[1]*Clin. Jour.* 1913, July, 209; [2]*Surg. Gyn. and Obst.* 1913, ii, 213; [3]*Ibid.* i, 379; [4]*Ibid.* 424; [5]*Lancet*, 1913, i, 1018; [6]*Brit. Med. Jour.* 1913, i, 332; [7]*Munch. med. Woch.* 1912, 2548; [8]*Reps. Hartmann's Clinics.* 4th Series, 1912, 101 (*Surg. Gyn. and Obst.* Abstr. 1913, i, 101); [9]*Jour. Amer. Med. Assoc.* 1913, i, 253; [10]*Brit. Med. Jour.* 1913, ii, 60; [11]*Ann. Surg.* 1912, ii, 738; [12]*Jour. Amer. Med. Assoc.* 1913, ii, 822.

PROTEINURIA.

Francis D. Boyd, M.D.

A number of important communications have appeared on the subject of *Bence-Jones' proteinuria.* An exhaustive chemical study of Hopkins and Savory[1] showed that the body was not, as generally believed, an albuminose, but a true protein, yielding the characteristic amino-acids on hydrolysis. The theories as to the origin of this protein are numerous, but the most important of these seek its derivation: (1) From the protein of the tissues or blood; (2) Specifically from the disease of the bones; and (3) As a product of abnormal protein metabolism, either endogenous or exogenous. The great majority of the cases in which this body is found in the urine have been instances of multiple myelomata, though not all sufferers from this disease have exhibited proteinuria, and in isolated instances it has been found associated with other pathological conditions such as leukæmia, chloroma, lymphosarcoma, myxœdema, and carcinomatous metastasis. The specific relation of the Bence-Jones protein depends upon the relative stability of its compounds with neutral salts at the boiling temperature, and their instability at lower temperatures. As Boggs and Guthrie[2] point out, it is important, in applying the heat and acid test to the urine for the detection of the protein, that it should be heated slowly, in order that differences of temperature in the determination of precipitation may be apparent. Should coagulation begin below the boiling point, more careful examination for detection of unusual protein is indicated. If precipitation occurs below the boiling point, careful notes should be made of any tendency towards clearing on boiling the specimen, and the test repeated with the aid of a water-bath and thermometer. Confirmatory tests are made by treating the specimen with a few drops of 25 per cent nitric acid: the initial turbidity in the cold is increased when approaching 60° C., and clears up more or less completely at 100° C., falling out again as the specimen cools. In a case observed by Henderson,[3] the saturated protein in aqueous solution coagulated at 50° C. For further confirmation, another specimen is treated with two volumes of saturated solution of ammonium sulphate, when a voluminous precipitation occurs, sometimes quite slowly. These tests are sufficient to establish the presence of the Bence-Jones protein. A striking feature in some of the cases was a diminution in the chloride excretion.

Notwithstanding the paradoxical incidence of Bence Jones proteinuria in bone-marrow disease, it seems probable that the marrow is in some way concerned in its production. Boggs and Guthrie's paper[2] in the *Johns Hopkins Hospital Bulletin* is well illustrated by x-ray photographs of metastatic nodules in the skull, pelvis, and long bones. (*See Plate XXXVI*.)

Groves[3] recounts a very unusual case of multiple myelomata with numerous spontaneous fractures, where proteinuria was present. The case is remarkable in respect that the history persisted over twelve years, and when observed, the patient appeared to be in good health, the disease being quite stationary. As a rule in these cases the prognosis is utterly bad, many sufferers having only survived the recognition of their complaint by a few months. For six years this patient had a long history of bone-breakings, seven times fracturing one or other of the long bones, in addition to developing tumours of the jaw, metacarpus, and tarsus. For the subsequent five years there had been no further development either of fractures or tumours. It is interesting to note that the fractures, although brought about by the development of tumours, always united firmly. (*See Plates XXXVII, XXXVIII.*)

The *morbid anatomy* of multiple myelomata and its associations with proteinuria are fully discussed by Shennan.[5]

REFERENCES.—[1] *Jour. of Physiol.* 1911, 189; [2] *Johns Hop. Hosp. Bull.* 1912, 353, and *Amer. Jour. Med. Sci.* 1912, ii, 803; [3] *Lancet*, 1913, i, 522; [4] *Ann. Surg.* 1913, i, 193; [5] *Edin. Med. Jour.* 1913, i, 321.

PSEUDO-GLANDERS. (*See* GLANDERS.)

PSORIASIS.

E. Graham Little, M.D., F.R.C.P.

Knowles[1] sets out to disprove the hereditary causation of psoriasis, and states that in nine years during which he has given attention to this point, only six cases of family inheritance have been made out to his satisfaction.

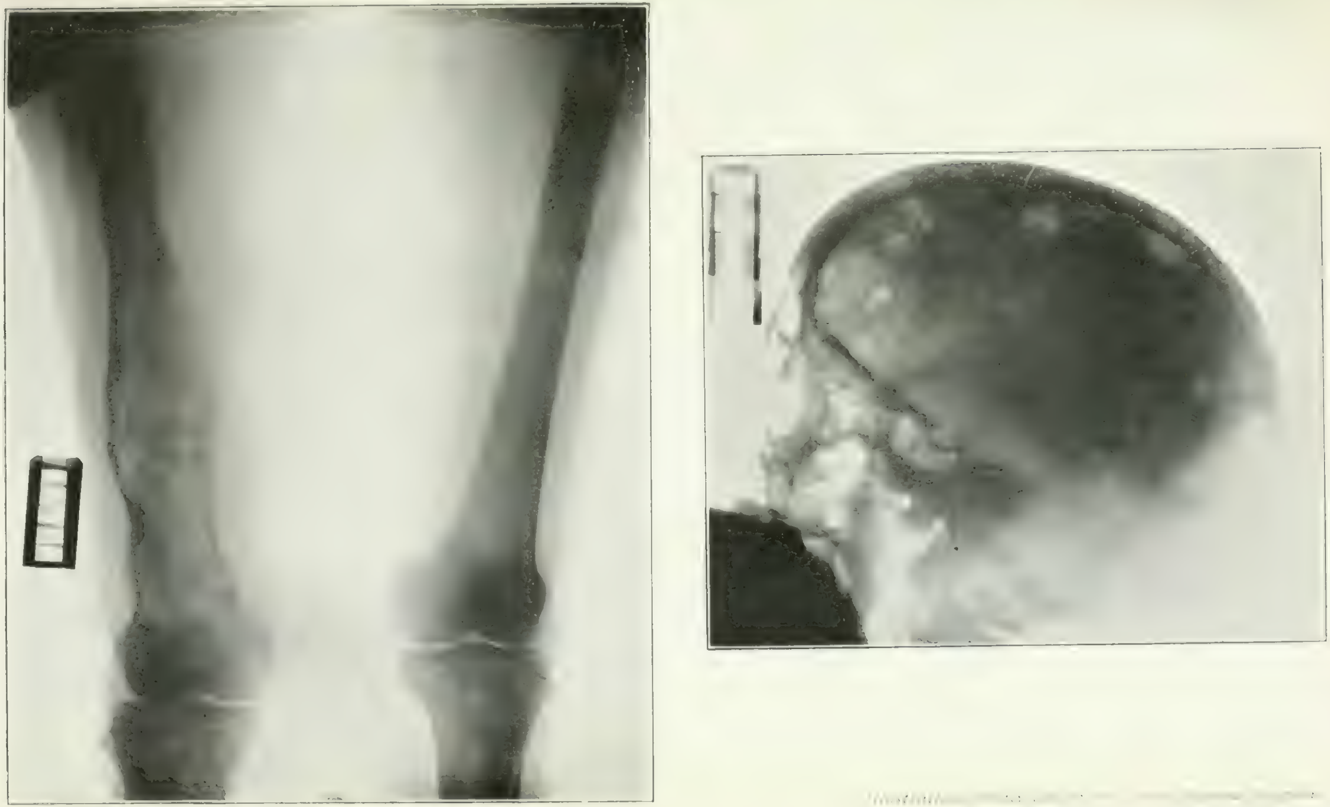
TREATMENT.—Brocq and Simon[2] say that, internally, there is no specific, but **Arsenic, Mercury, Iodide of Potassium, Thyroid Extract, Copaiba, Sandalwood Oil,** and **Turpentine** have all proved useful. **Vegetarian Diet** occasionally yields excellent results; externally, when the skin is much inflamed, **Starch** or **Gelatin Baths,** lasting twenty minutes. **Occlusive Dressings** with rubber tissue should be used, and **Benzonaphthol Ointment,** beginning with 1–30 strength, progressively increased. When the patient must conduct his own treatment, **Sulphur** or **Alkaline Baths** should be given daily, immediately followed by rubbing in the following ointment:—

℞ Ol. Cadini	part. v	Glycerini Amyli	part. xxiv
Sapon. Moll. q.s. (for emulsification)		Acid. Salicyl.	part. iij
		Essent. Caryoph.	part. x

If this should prove too irritable the oil of cade and salicylic acid should be reduced. Flannel combinations should be used, so that the oil saturates the fabric and the patient constantly steeps in it. Where

PLATE XXXVI

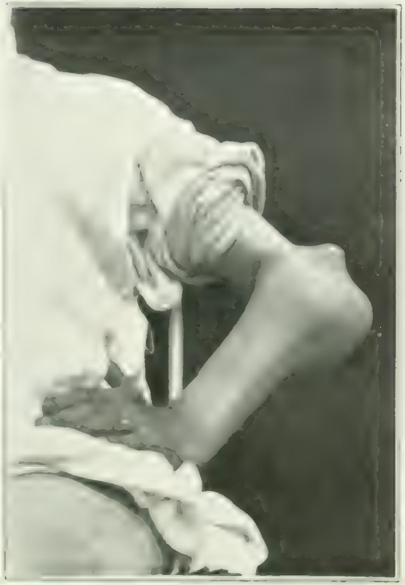
SKIAGRAMS SHOWING METASTATIC NODULES IN THE LONG BONES AND SKULL



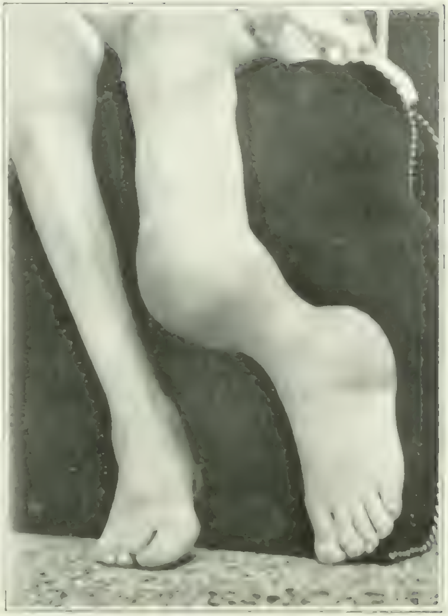
[illegible]

PLATE XXXVII

CASE OF MULTIPLE MYELOMATA



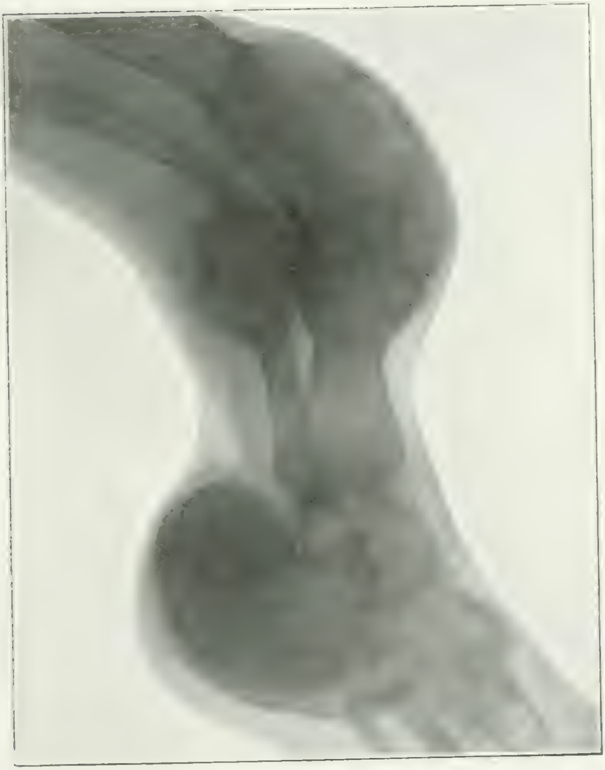
[illegible]



[illegible]

PLATE XXXVIII.

CASE OF MULTIPLE MYELOMATA



[illegible]

[illegible]

[illegible]

[illegible]

the smell of this application forbids its use, the following may be substituted :—

R	Acid. Salicyl.	gr. viij	Vaselini	ʒx
	Acid. Pyrogal.	gr. xvj		

The urine must be watched for evidence of pyrogallic poisoning. **Calomel** ointment from 1-50 to 1-20 may be used, salivation being watched for. Where the patient can be continually kept under observation, **Chrysarobin** is the most efficient application (but not on the scalp), and for small areas this ointment may be recommended :—

R	Chrysarobini	ʒj	Vaselini	℥v
	Acid. Salicyl.	gr. xlv		

The chrysarobin in this formula may be increased gradually to ℥j

Montgomery[3] dwells on the advantages of **Baths,** and especially recommends the following combination : the patient soaks for ten to fifteen minutes in a warm bath to which an ounce of saturated solution of **Potassium Permanganate** is added ; he is thoroughly dried, and the following thin paste is applied :—

R	Amyli		Liq. Plumbi Subacet.	part. iv
	Talci	āā part. xl	Liq. Picis Carbonis	part. xx
	Glycerini	part. xx	Aq.	part. cc
	Gumm. Arabic.	part. j		

Maceration by means of impermeable coverings is especially useful in chronic thickened patches. The following paste, applied to the part, which is then covered with oil-silk kept in position with plaster, is especially active :—

R	Acid. Salicyl.	part. x	Sapon. Virid.	
	Chrysarobini		Lanolini	āā part. xxv
	Ol. Rusci	āā part. xx		

Or the following lotion :—

R	Liq. Plumbi Subacet.	part. xx	Liq. Picis Carbonis	part. c

One drachm of this is added to a pint of water ; lint soaked in this solution is applied to the parts, which are covered with oil silk and left so all night.

Ravogli[1] has come to adopt the " nervous origin " as an explanation of psoriasis, and prefers the treatment by arsenic. Salvarsan he has found useless in the few cases he has tried. He habitually uses subcutaneous injections of **Cacodylic Acid** (10 per cent), one injection two or three times a week. He recommends for local application the following ointment :—

R	Hydrarg. Precip. Alb.	gr. v-x	Acid. Carbol.	gutt. vj
	Bismuth. Subcarb.		Petrolat. Alb.	℥j
	Zinci Oxidi	āā ʒss		

When arsenic disagrees, or ceases to produce effect, **Potassium Iodide** should be substituted in combination with the salve named above.—[The writer has had some further encouraging experience with **Enesol** injections, given in 2 c.c. doses intramuscularly every second day for fifteen to twenty injections. No mercurial or arsenical intoxication has resulted from its use, and it can be recommended.—E. G. L.] [*See also* SKIN, GENERAL THERAPEUTICS OF.]

[illegible], [1]*Jour. Amer. Med. Assoc.* 1912, ii, 413; [2]*Med. Press and Circ.* 1912, ii, 180; [3]*Jour. Amer. Med. Assoc.* 1912, ii, 420; [4]*Jour. Cut. Dis.* 1913, 250.

PSYCHO-ANALYSIS.

Bedford Pierce, M.D., F.R.C.P.

At the International Congress of Medicine, 1913, C. G. Jung, of Zurich, stated his reasons for not accepting Freud's teachings in respect to the etiological significance of infantile sexual trauma in the production of the neuroses. This disclaimer by one of the chief exponents of psycho-analysis provoked much interest. Several who joined in the discussion, re-asserted their acceptance of Freud's theory in its entirety, and stated that its application in therapeutics was of great value. Others, however, welcomed Jung's pronouncement as freeing psycho-analysis from an etiological assumption that was fanciful and far-fetched.

After stating that the original theory that hysteria and the related neuroses take their origin in trauma or shock of a sexual character in early childhood was given up by Freud fifteen years ago, and that many patients who had related an early traumatic event had invented the story of a so-called trauma, Jung dealt with Freud's "fixation theory." "From the standpoint of this theory, the neurotic appears to be entirely dependent upon his infantile past, and all his troubles in later life, his moral conflicts, and his deficiencies, seem to be derived from the powerful influences of the past." The therapy is in full accordance with this theory; its "chief concern is conceived to be the unravelling of this infantile fixation which is understood as an unconscious attachment of the sexual 'libido' to certain infantile phantasies and habits." . . "It is worth while to demand the nature of the proofs of this infantile fixation." And after discussing the question he states, "I have to state that a purely sexual etiology of neurosis seems to me much too narrow. I base this criticism upon no prejudice against sexuality, but upon an intimate acquaintance with the whole problem. Therefore I propose to liberate the psycho-analytic theory from the purely sexual standpoint." Jung considers psychological phenomena as manifestations of energy, which he terms "libido," desire, but not confining the term to sexual desire. He considers that the neuroses arise through a failure of adaptation producing regressive changes. "Therefore I no longer find the cause of the neurosis in the past, but in the present. I ask what the necessary task is which the patient will not accomplish. . . . A sensitive and somewhat disharmonious character will meet special difficulties. . . . For the neurotic there is no established way to his aims and tasks. . . . The way of adaptation being blocked, the biological energy we call libido does not then find its suitable outlet or activity, and therefore replaces the modern and suitable form of adaptation through an abnormal, i.e. primitive one. . . . It is perfectly true, as Freud states, that infantile phantasies determine the form and further development of the neuroses, but this is not etiology. Even when we find perverted sexual phantasies of which we can prove the existence in childhood, we cannot consider them of etiological significance. To sum up: I cannot see the real etiology of a neurosis in the various manifestations of infantile sexual development and their corresponding phantasies. The fact that they are exaggerated and put into the foreground in neurosis is a consequence of a stored-up energy or libido. The psychological trouble in neurosis, and neurosis itself, can be considered as an act of adaptation that has failed. This formulation might reconcile certain views of Janet's with Freud's view that a neurosis is—under a certain aspect—an attempt at self-cure; a view which can be, and has been, applied to many diseases. Here the question arises whether it is still advisable to bring to light all the patient's phantasies by analysis, if we now consider them as of no etiological significance. Psycho-analysis hitherto has proceeded to the unravelling of these phantasies because it considered them as etiologically significant. My altered view concerning the theory of neurosis does not change the procedure of psycho-analysis. The technique remains the same. We no longer imagine we are unravelling the final root of the disease, but we have to haul up the phantasies because the energy which the patient needs for his health, i.e., for his adaptation, is attached to the sexual phantasies. Through psycho-analysis you re-establish the connection between the conscious and the libido in the unconscious. Thus you restore this unconscious libido to the command of conscious intention. Only in this way can the formerly split-off energy become again applicable to the accomplishments of the necessary tasks of life. Considered from this standpoint, psycho-analysis no longer appears to be a mere reduction of the individual to his primitive sexual wishes, and it becomes clear that psycho-analysis, rightly understood, is a ***highly moral task of an immense educational value.***"

Alexander Neuer[1] alludes to the amazing change of front of the Freudian school, criticizes Jung's use of the word "libido," and attempts to show that he is indebted to Adler and Maeder for many of his views. His article sets forth plainly the confusion at present existing in the ranks of the psycho-analysts.

REFERENCE.—[1] *Jour. Ment. Sci.* 1913, Oct.

PUDENDAL GRANULOMA. (*See* GRANULOMA, PUDENDAL.)

PULMONARY EMBOLISM. (*See* LUNG, SURGERY OF; OPERATIONS, COMPLICATIONS FOLLOWING.)

PULMONARY TUBERCULOSIS. (*See* TUBERCULOSIS, PULMONARY.)

PUNCTURE FLUIDS. (*See also* CEREBROSPINAL FLUID.)

Oskar C. Gruner, M.D.

A good review of the clinical examination of puncture fluids is given by Janowski,[1] whose conclusions on its practical value, however, are somewhat pessimistic. The variations of specific gravity are well shown in his curves (*Plate XXXIX*), which bring out the fact that even a transudate may have as high a specific gravity as an exudate, although there may be reason for including the fluid, in spite of its high specific gravity, in the list of non-inflammatory cases. The albumin content varies in a similar way, and the figures afford as little reliable index to the character of the fluid as those representing the specific gravity. The examination for viscosity has been abandoned. It does not depend upon the amount of albumin present. The range of variation of freezing-point depression is very little different in two classes of fluid. The cellular content of the fluid varies so much with the stage of the disease that a number of facts require to be taken into consideration before making deductions.

Marrack[2] discusses the cause of *milkiness* of body fluids without advancing much further than has been done in the past. He finds the following possible explanations: that it is lipoid, globulin, or a lipo-protein. Against the first two are the facts that the turbidity is not removed by ether, and the granules are not stainable with Scharlach R. They are cleared by ether after adding potash. These fluids are alkaline to litmus, and unaltered by centrifuging, shaking with charcoal, hydrochloric acid, soda, acetic acid, normal saline or ether. They are rendered clear by precipitation with an equal volume of absolute alcohol, or boiling with a few drops of acetic acid and saturating the filtrate with ammonium sulphate. In each case, the clearing is accompanied by precipitation.

REFERENCES.—[1]*Rev. de Méd.* 1912, 720; [2]*Quart. Jour. Med.* 1913, July, 403.

PURPURA. (*See also* SCARLET FEVER.)

Herbert French, M.D., F.R.C.P.

Chronic purpura in adults is not common, but it may be very difficult to cure; and although it may not kill, it may be associated with ulcerations and other symptoms which render the patient very ill, or even bedridden, for years. Some recent cases of this kind are recorded by Elsner and Meader.[1] There are two principal classes: (1) *The continuous form*, and (2) *The intermittent.*

1. In the continuous form of the disease, patients present symptoms of general debility and rheumatism, or of gastric or intestinal troubles. Examination shows ecchymoses or purpuric spots which have been present for years, to which no importance has been attached because of their rapid disappearance. Epistaxis and gingival hæmorrhages are common.

2. The intermittent form appears to be more frequent. In these cases crises are separated by intervals of varying length. Crises are sometimes preceded for months, or even years, by frequent isolated hæmorrhages, epistaxes, and stomatorrhagias; they may be accompanied by pyrexia. After a variable length of time, often prolonged by the subintrant attacks so well known in the course of all purpuras, a latent phase follows when the patient appears cured. Until the appearance of a new crisis there are no morbid phenomena. More often, it

PLATE XXXIX.

CLINICAL EXAMINATION OF PUNCTURE FLUIDS

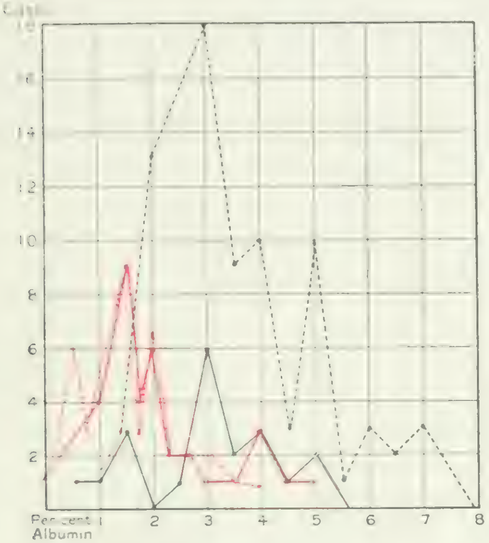


Fig. A.—Curves of percentage of albumin in transudates (red) and exudates (black). The continuous lines represent peritoneal fluids, the dotted lines pleural fluids. Ordinates = number of cases; abscissæ = percentage of albumin content.

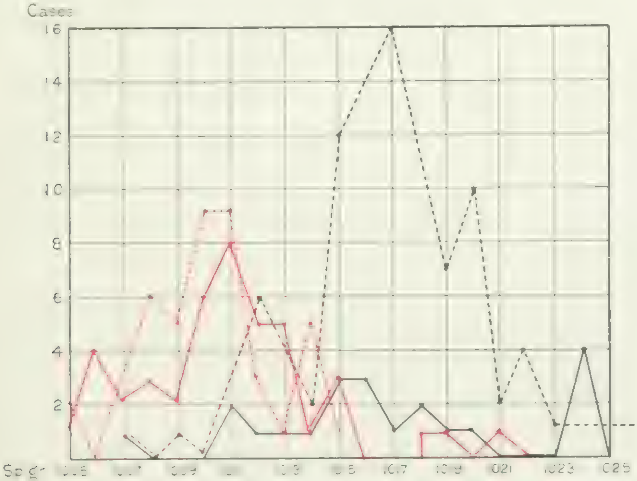


Fig. B.—Curves of specific gravity of transudates (red) and exudates (black). The continuous lines represent peritoneal fluids, the dotted lines pleural fluids. Ordinates = number of cases; abscissæ = specific gravity.

questioned carefully, however, some symptoms are mentioned; these include epistaxes, ecchymoses following the slightest traumatism or prick, or menorrhagia suggesting uterine disease. At other times the general condition is disturbed; patients complain of stiffness; digestion is slow, painful, and accompanied by heaviness after meals; patients accommodate themselves to this condition until, as a result of influences not well determined, a new crisis follows, confirming the existence of the *chronic and intermittent* type of the disease.

TREATMENT.—It is by no means improbable that purpuras of this kind are the result of microbial toxins absorbed from some septic focus, such as the gums or tonsils; but it is seldom easy to detect the infecting organism and remove the cause. Any additional means of relieving the patient's symptoms is welcome, and Elsner and Meader find such in fresh **Rabbit's Serum**, which they inject subcutaneously. From practical experience they prefer serum from a rabbit to that from other animals. They advise that it should be given for ten-day periods, with considerable intervals between successive courses, in order to avoid as far as possible the discomforts and dangers of anaphylaxis. They advocate quite small doses—from 1 to 5 c.c. The beneficial effects in the cases they treated were very marked, but the morbid process was not permanently cured; they believe that successive periods of the serum treatment are essential.

The cure of a very severe case of *Henoch's purpura* by means of injections of **Human Blood Serum** is recorded by Wilson.[2] The patient, a boy of nine, had received various other forms of treatment, and his condition was so extremely serious that the prognosis seemed hopeless, when it was decided to resort to injections of human blood serum obtained by venesection from the boy's father. Five injections were given altogether, on successive days, and all subcutaneously. The first and second amounted to 45 c.c. each, the third to 72 c.c., and the fourth and fifth to 90 c.c.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* 1913, i, 178; [2]*Med. Rec.* 1912, ii, 249.

PYELITIS IN CHILDREN. (*See also* URINARY INFECTIONS.)

Frederick Langmead, M.D., F.R.C.P.

ETIOLOGY.—The frequency and importance of infection of the urinary tract in children by the *Bacillus coli communis* is becoming more generally recognized. John Thomson[1] has added to his previous contributions a study of seventy-one cases. He observes that it is scarcely ever possible to decide in any individual case which route the bacilli take in passing from their original harmless position to the urinary passages. It is, however, quite certain that they are sometimes carried there by the blood-stream, sometimes pass in by the lymphatic channels, and sometimes ascend from outside by the lumen of the urinary tract. There is great probability that the organisms often follow a combination of these paths.

Some predisposing influence is necessary for the bacilli to become pathogenic. Thus, in thirty-two cases out of the seventy-one, the symptoms of the urinary disease began during, or shortly after, some weakening disease or experience. In three-fourths of these the predisposing ailment was a bowel disturbance of some kind. Children with congenital hydronephrosis and dilated ureters, with hypertrophy of the bladder, are very apt to be infected in the early days or weeks of life. In fact, if much pus and colon bacilli are found in the urine of a baby a few days old, and on palpation an enlarged and thickened bladder can be made out, we are justified in diagnosing congenital hypertrophy of the bladder, with dilatation of the upper urinary passages.

SYMPTOMS.—He summarizes the more important clinical features. The disease may begin within the first weeks of life, and is twice as common in children under two years as it is after that age. Though generally much more severe in the younger children, it occasionally presents its severest and most characteristic forms in later childhood. As a rule, boys are affected at an earlier age than girls. There is a group of extremely chronic and intractable cases, which is almost confined to later childhood. These begin after an acute illness—generally measles; and many of them prove to be tuberculous.

The relative proportion of cases in the two sexes, and the ways in which the clinical details differ in boys and girls, are among the most striking features of the disease. In all the lists of cases published the number of girls is much the larger. In Thomson's own cases the girls formed 70 per cent. The illness in young infants begins more often with diarrhœa than in older children, and this symptom is more commonly severe in boys than in girls. During the first six months of life, boys are more frequently affected than girls, although after this period the greatest incidence is among girls. The rarity of rigors at the onset of the symptoms in boys is noteworthy as compared with girls. In none of his fifteen male cases did this symptom occur at the onset. Mild cases of *Bacillus coli* infection are rare in boys, and in them the pyelitis is apt to be severe and associated with fatal pyelonephritis. As a possible explanation of these differences in the two sexes, he suggests that the greater frequency in girls is due to the ease with which infection may occur *per urethram* in them. The frequency of pyelonephritis in the male sex may be due to the fact that in boys infection passes straight from the bowel to the kidney and its pelvis. The much commoner occurrence of rigors in pyelitis in girls than in boys, or in pyelonephritis in either sex, may mean that the ureters are that part of the urinary tract irritation of which is most likely to produce the symptom; for in the pyelitis of girls the infection is probably an ascending one.

The symptoms vary with the severity of the disease and the part of the tract affected. When it has not spread beyond the bladder, it may be impossible to recognize any symptoms, apart from the presence of pus and bacteria in the urine. Careful questioning, however, may elicit a history of increased frequency of micturition, with pain or discomfort during the act, and perhaps also of hæmaturia and an offensive urine.

The most important cases are those of pyelitis, pyelocystitis, and pyelonephritis: and the striking peculiarity about their symptoms is the trivial and equivocal nature of the local manifestations, and the great severity of the general disturbance.

The temperature rises rapidly, reaching 103°–105° F., or even higher, and frequently assuming a remittent type. This may go on for many weeks, with or without periods of intermission, but under alkaline treatment the pyrexia generally ends by crisis within forty-eight hours, although in about half the cases the temperature rises again a few days after. The frequency of rigors in young children with acute pyelitis is interesting, because rigors from any cause are so rare at this age. Vomiting occurs in more than half of the cases, especially during the first few days of the attack. The extreme misery, restlessness, and general tenderness from which the children suffer when their temperature rises, form valuable diagnostic signs. They are drowsy and often delirious, and if they are very young, frequently squint. The respiratory rate often quickens in proportion to that of the pulse. In many cases there is disinclination for food, even for fluids. Local signs are either slight or absent. Frequency of micturition is common, and occurs usually at the onset. In older children, dysuria is more likely to be troublesome than in infants. Definite vulvitis or vaginitis had not occurred in any of the cases.

The features of the *urine* are much the same whether the case is one of simple cystitis, pyelitis, or pyelonephritis; but in pyelonephritis there is rather more albumin present, and a few tube casts may be found. The urine, when passed, usually looks slightly cloudy or opalescent, is distinctly acid, and contains many pus cells and bacilli of the colon group. On standing, it remains cloudy for a long time, and a definite deposit is slow to form. The reaction soon changes, and in time becomes alkaline. On microscopical examination the pus is rarely seen to be large in amount, and in pyelitis may be absent altogether when first the temperature rises.

DIAGNOSIS.—This depends upon the presence of pus and colon bacilli in the urine in association with the foregoing symptoms, and upon the absence of any sign of organic disease outside the urinary tract which could explain the condition. The exact distribution of the lesions cannot be accurately determined in young children. Roughly speaking, patients who have pus and bacilli in an acid urine, with no fever or distress, have cystitis only; remittent pyrexia with general misery signifies pyelitis; whilst severe collapse with or without pyrexia often indicates a grave implication of the kidney.

N. Percy Marsh,[2] from a study of twenty-three cases, draws a very similar clinical picture of the disease. He mentions a peculiar and unpleasant fishy odour of the urine. In three cases, occurring in infants, general œdema was marked; and he regards puffiness and swelling of the eyelids as a not uncommon symptom in older children. In the latter he recognizes acute and chronic forms. In the acute form, either the constitutional or local symptoms will predominate, depending on whether the case is one of pyelitis or cystitis. In the former, the onset resembles that of the disease in infants, with shiverings, restlessness, high fever, anorexia, headache, and vomiting. Herpes may appear on the lips, the abdomen may be slightly distended and the spleen enlarged. Nervous symptoms are sometimes severe, and produce a symptom-complex which may simulate cerebrospinal meningitis, restlessness and irritability being associated with a crouched-up attitude, head retraction, muscular twitchings, hypertonus and delirium. When local symptoms are present, the diagnosis is less difficult, the patients suffering from increased frequency of micturition, dysuria, and incontinence. Differing from Thomson, he says that signs of inflammatory irritation are often present around the meatus and vulva, and that in some cases enlargement of the kidney may be felt; in other cases pain may be referred to the subcostal and epigastric regions, and there may be rigidity of the abdominal muscles. Chronic and persistent infections are occasionally seen in infants, but more frequently in older children. In these there is a persistent bacilluria, with but little evidence of inflammation, and little or no constitutional disturbance. Nocturnal enuresis is not infrequently met with. The children are generally poorly nourished, anæmic, and flabby; they suffer from general malaise, and may have a slight elevation of temperature which persists over a long period. Periodical exacerbations are apt to occur, which may assume the form of attacks like those of cyclical vomiting, or there may be joint pains with dullness and apathy, resembling rheumatism. In two cases skin eruptions, consisting of wheals, as in urticaria, and pemphigoid blebs were the most prominent manifestations.

Treatment.—Thomson holds that in ordinary acute cases the first indication is always to ensure a free discharge of urine, usually by giving large quantities of **Fluid** to drink. If the patient refuses to drink enough the fluid must be administered through a stomach tube or by the rectum. The second indication is to see that the bowels move adequately. For this purpose he recommends **Sodium Phosphate,** because it helps in the alkalinization of the urine. An occasional dose of **Calomel** is often beneficial.

The urine should be rendered alkaline, and kept so for a week or two after all pus has disappeared and the signs of uneasiness have ceased. He favours the use of **Potassium Citrate** for this purpose. One should begin with 60 gr. daily if the patient is under two years old, but 150 or 180 gr. per diem may be necessary before the urine becomes alkaline and the temperature falls. Occasionally the urine becomes alkaline within a day or two after beginning the treatment; generally this is attained in four or five days, rarely in six or seven days, but never longer in his experience.

Antiseptics such as **Mercury,** given by the mouth, may be beneficial by their bactericidal action in the alimentary canal. **Salol,** in doses of 2 to 4 gr., three or four times daily, is often helpful, combined with the alkaline treatment, especially in the later stages. He has found **Urotropin** and its derivatives disappointing.

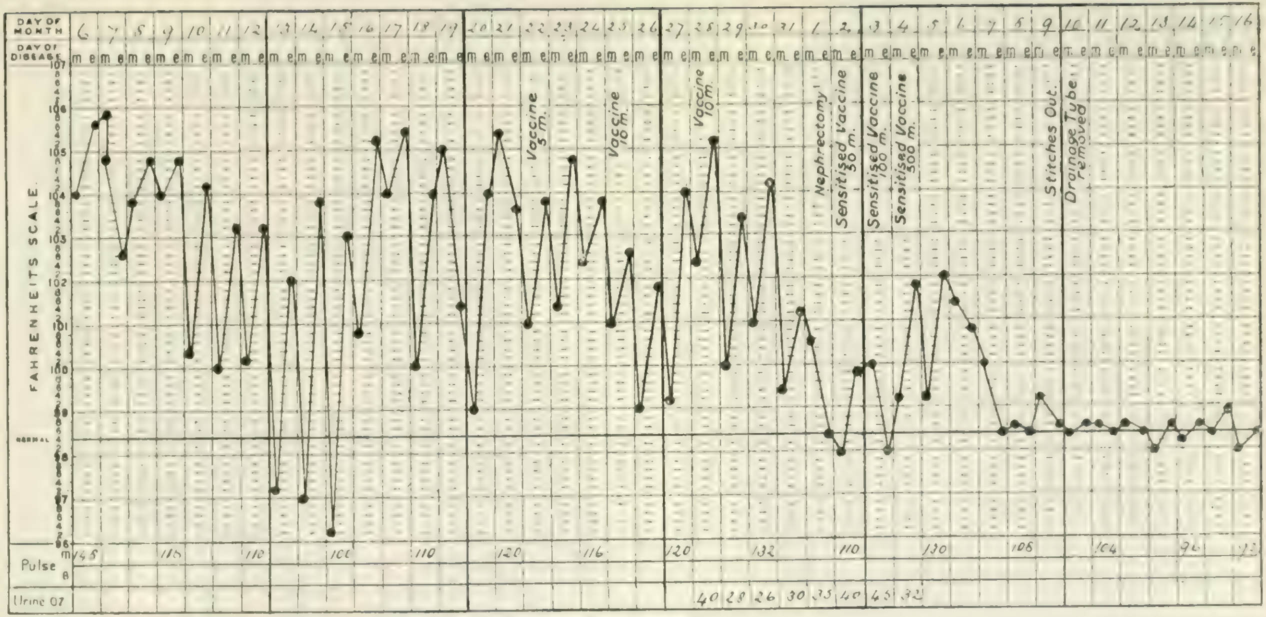


Fig. 4. – Temperature Chart of Mr. Harold W. Wilson's case of Pyeli-nephritis due to the Bacillus coli communis.

Cacoppo, Comba, Dudgeon, and others have found **Serum** treatment successful. Thomson has found **Vaccines** of little use, but has known them in other hands occasionally quite successful in acute cases, especially in older children. The large doses of potassium citrate may cause diarrhœa. When this occurs Still has found that alkalinity may be maintained by 5 to 10 gr. of **Bicarbonate of Sodium** or **Potassium** given every two or three hours. Marsh states that **Citrate of Soda** added to infants' feed is equally valuable. According to this writer the treatment recommended by Betz is directly opposed to the alkaline treatment. He advocates **Phosphoric Acid** and a meat and no vegetable diet in order to make the urine strongly acid, limits the amount of fluid, and prescribes hot air baths to encourage concentration of the urine.

Harold W. Wilson[3] has recorded a case of a girl of 7, in whom the right kidney was severely damaged as the result of *B. coli* infection, the condition resembling that of the usual "ascending nephritis." After an autogenous vaccine had been tried without benefit for sixteen days, he removed the kidney, and the child made a good recovery. (*See Fig.* 45 *and Plate XI.*)

REFERENCES.—[1]*Lancet*, 1915, ii, 907; [2]*Maryland Med. and Chir. Jour.* 1915, 310; [3]*Brit. Jour. Child. Dis.* 1915, 250.

PYLORIC STENOSIS, CONGENITAL.

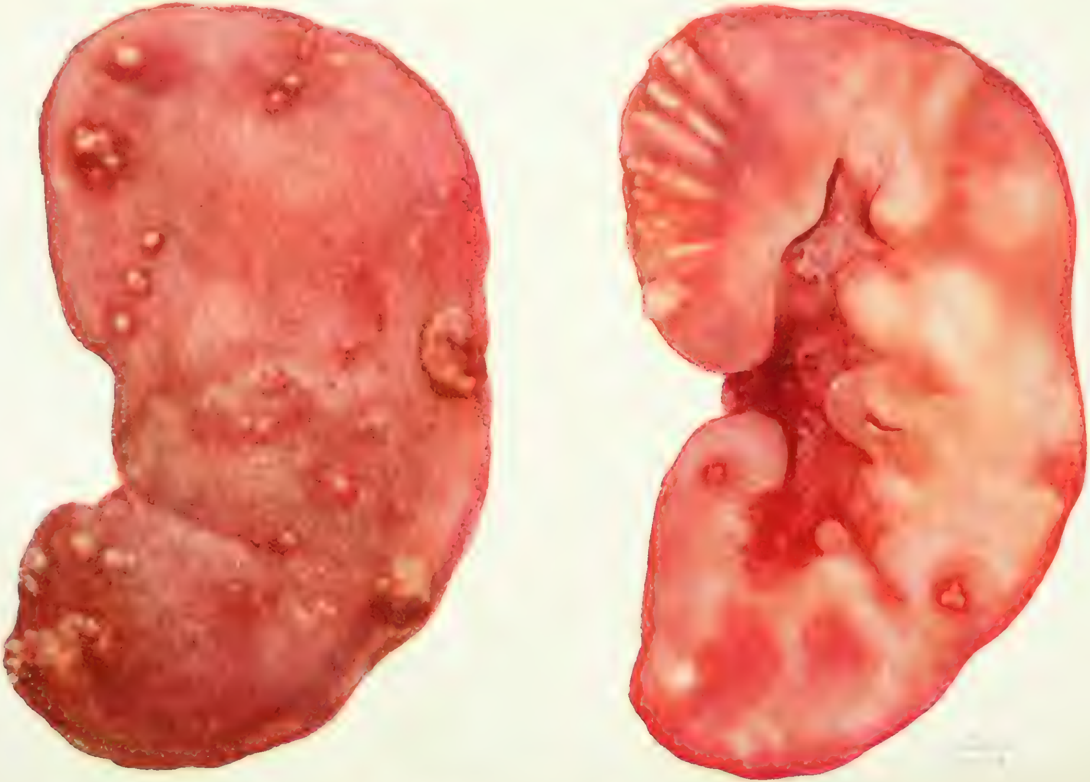
Frederick Langmead, M.D., F.R.C.P.

ETIOLOGY.—Authors are still at variance as to the cause of this condition, some holding that it is a true congenital malformation, others that it owes its origin to pyloric spasm, the hypertrophy of the pyloric musculature following the over-action. It is difficult to understand how cases could be cured by purely medical means if the former view is correct. To explain this discrepancy, some of its supporters contend that an independent condition—one of pure pyloric spasm—exists, and that it is cases of this nature which get well under medical treatment. Most English observers, however, do not recognize this distinction.

Koplik[1] classifies cases of the affection into three groups: (1) Pure spasm of the pylorus and pyloric end of the stomach without the pylorus being palpable, but with peristalsis, explosive vomiting, loss of weight and consequent inanition. Constipation may be absolute, or but little fæcal matter may be passed, which may be green and fluid, or brownish. (2) Pyloric spasm with partial or actual stenosis, with slight or marked thickening or hypertrophy of the tissues of the pylorus. In such cases there is vomiting of the explosive form, coming on soon after birth, and continuing for some time, with a palpable pylorus, either from the onset or developing later. The pylorus can be felt to harden under the finger at the time of greatest peristalsis of the stomach, and to soften after vomiting has occurred. There is constipation, complete at first, which afterwards lessens. There is marked progressive atrophy and inanition. (3) So-called congenital hypertrophy of the pylorus with stenosis. These cases show exactly

PLATE XI.

BACILLUS COLI INFECTION OF THE KIDNEY



[illegible] removed by Mr. Martin W. Ware [illegible]
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the same symptoms as those of the previous class, but in a more aggravated form.

He believes that the condition is due to a neurosis—in some cases hereditary. In support of his contention, he instances a family group which came under his observation. Two sisters suffered from the disease. One of them had two children, and the other one, similarly affected. The second month of life is the period in which the symptoms are most severe, and they become less after the third month. He thinks that the breast milk of some mothers is a direct inciting element. Peristalsis continues long after vomiting has ceased, and the pylorus can be felt to harden and soften under the finger long after the infant is on the road to recovery.

PROGNOSIS.—Koplik recognizes the difficulty of prognosis in these cases. Some infants with pyloric stenosis and hypertrophy lose weight slowly after the first decrease, and keep vigorous, though wasted; others, with symptoms and conditions apparently similar, lose weight rapidly, pass into an alarming state of inanition in a short time, and die.

TREATMENT.—Whether the treatment should be purely medical or purely surgical, or whether surgical aid is sometimes called for, are still vexed questions. Koplik holds that vomiting, peristalsis, and loss of weight are no indications for surgical interference, however alarming the symptoms may be. In his opinion, it is only in cases with absolute constipation and a palpable tumour that the question of surgical treatment arises, and that even here the vast majority recover by medical treatment alone. As fully 90 per cent of his apparently hopeless cases got well without surgery, he regards the prognosis as more favourable under treatment which is not surgical. He refers to some of the methods which have been advocated recently. Einhorn has proposed to pass through the pylorus a bucket, with a dilator attached to its leading string. As Koplik remarks, any pylorus which admits of this procedure is not likely to cause the child's death. Hess has suggested that a duodenal catheter should be passed through the pylorus, and either left in the lumen for a time or used as a means of pouring food directly into the duodenum. Koplik has seen the catheter fail to pass through the pylorus, and in one mild case, in which it passed, although the vomiting was temporarily relieved, it returned with increased intensity. He therefore relies on the older methods, which include very careful **Feeding, Lavage, Opium**, and, what is of greatest moment, persistence and attention to detail. He thinks that in future, more attention should be paid to the relative acidity of the stomach contents.

The *kind of operation* which should be performed is still disputed by surgeons. Frédet,[2] who, with Stiles, formerly favoured pyloroplasty, now considers gastro-enterostomy the better operation in all but the less difficult cases. From the point of view of treatment, he separates the milder grades of stenosis, which are amenable to medical measures. Such treatment falls under the following heads:

(1) Reduction of superadded inflammation by diet, lavage, regulation of nursing, or replacing of milk by a more easily digestible food; (2) Control of the spasm by **Atropine**, etc.; (3) Maintenance of nutrition by injections of serum, lavage, etc. It must not be forgotten that some of the most satisfactory results published were obtained by Loreta's operation.

References.—¹*N.Y. Med. Jour.* 1913, i, 57; ²*Surg. Gyn. and Obst.* 1913, i, 573.

RABIES.

Herbert French, M.D., F.R.C.P.

Noguchi¹ claims to have cultivated the virus of rabies and to have produced hydrophobia experimentally in dogs, rabbits, and guinea-pigs, by inoculation with cultures that he has obtained. He believes that certain granular nucleated corpuscular bodies that he has found in microscopical preparations from the cultures are actually the living virus that produces hydrophobia. These bodies have a very pleomorphic character, as is shown by the illustration.

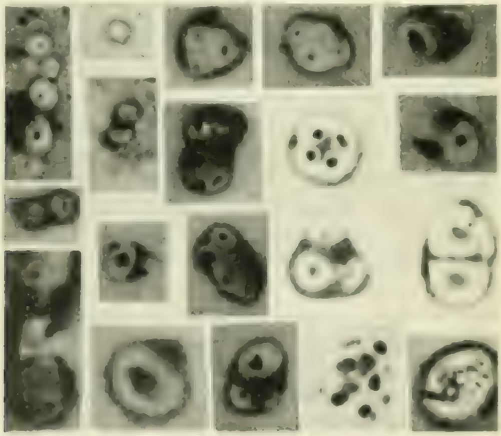


Fig. 46.—Cultures of rabies virus. [illegible]

Reference.—¹*Presse Méd.* 1913, 726.

RAT BITE FEVER.

Herbert French, M.D., F.R.C.P.

The bite of a rat is sometimes followed by a peculiar fever, one remarkable feature of which is that it occurs long after the bite itself has healed; the incubation period may be anything from five weeks to two months. The invasion is generally sudden, with shivering or rigors, weakness, headache, and pyrexia; the healed rat bite becomes inflamed and surrounded by lymphangitis. The chart (*Fig.* 47) shows the peculiar character of the temperature in a case recorded by Rodman.¹

The relatively long incubation and the periodicity of the febrile attacks recall some of the characters of relapsing fever, and perhaps

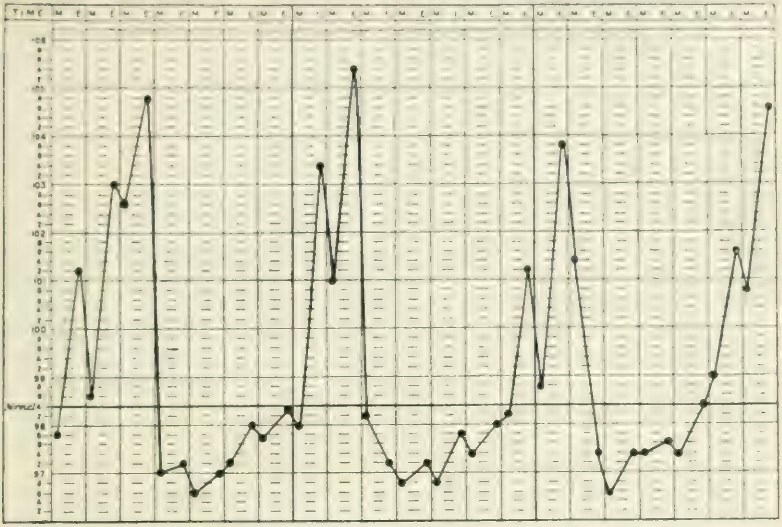


Fig. 47.—Chart of rat-bite fever.

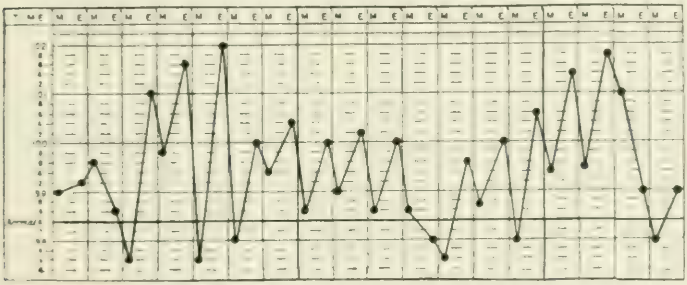


Fig. 48.—Rat-bite fever.—Temperature during early fever, twenty-eighth to forty-fourth day (August 5th to August 22nd).—Character of temperature lasting four and a half weeks.

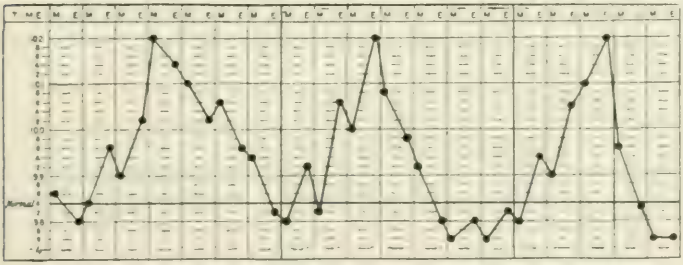


Fig. 49.—Rat-bite fever.—Showing the character of the temperature during the later period of fever from September 14th to October 3rd), and lasting for ten and a half weeks.

rat-bite fever is also due to a hæmatozoon related to the *Spirillum obermeieri*. The charts (*Figs.* 48, 49), are from an English case recorded by Cruickshank.[2]

A very full account of the disease is given by Atkinson,[3] with a series of typical temperature charts.

REFERENCES.—[1]*Pract.* 1913, ii, 86; [2]*Brit. Med. Jour.* 1912, i, 1317; [3]*Med. Chron.* 1913, xxv, 1.

RECTAL DISEASES. (*See also* ANUS, DISEASES OF.)

Sir Charles Bent Ball, Bart., M.Ch., F.R.C.S.

The Surgical Anatomy and Pathology of the Colon, illustrated by Radiography.—Granville S. Hanes[1] has determined some interesting facts by x-ray photographs of the colon distended with bismuth buttermilk through an appendicostomy wound. No regurgitation of the mixture took place through the ileo-cæcal opening into the ileum. The large intestine gradually decreases in size from the cæcum to the rectum; the hepatic flexure is a gradual curve, while the splenic flexure appears as a sharp angle at the highest point reached by the colon in the abdominal cavity.

In order to test for any evidence of anastalsis or reversal of the peristaltic wave, the author slowly injected bismuth mixture into the rectum, and with the screen watched it flow round to the cæcum. He satisfied himself that the passage of the fluid from the rectum through ascending, transverse, and descending colon was only the result of the pressure applied in introducing it, without any sign of reversed peristalsis. He considers the cases in which fæces pass from an ileosigmoidostomy back towards the cæcum explained by the fluid following the line of least resistance, and not as a result of a definite peristalsis.

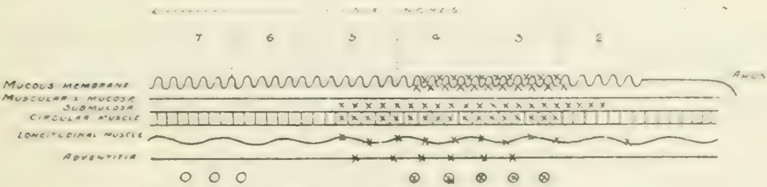
By radiography, Hanes also investigated the possibility of passing tubes from the rectum into the descending colon. He found that in one case a fourteen-inch colonoscope could be introduced, and a skiagraph showed that the end of the tube had reached a level two inches above the umbilicus. He then introduced a flexible tube thirty inches in length, but found by skiagraph that after reaching the commencement of the sigmoid it had coiled on itself without penetrating further up the bowel. By passing a colonoscope to the commencement of the sigmoid and a flexible tube through this, it apparently entered further into the sigmoid but not into the descending colon. After distension of the large intestine with bismuth mixture and passage of a fourteen-inch colonoscope up to its whole length, the skiagraph clearly shows that the point of the instrument had caught in one of the lower loops of the sigmoid, and pushed this up into the abdomen as far as the mesocolon would permit; the greater part of the sigmoid, rendered evident by the bismuth mixture, was seen lying in its usual position in the pelvis.

Cancer.—K. W. Monsarrat and Idwal J. Williams[2] do not appear to accept Handley's theory as to the widespread dissemination of cancer of the rectum, founded on the ground that he had found cancer cells containing mucin or small masses of mucus, which he supposed represented degenerate cancer cells, at least six inches above the cancerous growth, in the plane of tissue lying between the blind ends of the Lieberkuhn follicles and the underlying muscularis mucosæ, and which he considered showed permeation of the lymphatic plexus in this place. Handley's observations were based on the well-known action of mucicarmine as a selective stain for mucin. The authors consider it is probably incorrect to look upon the presence of mucin in bowel carcinoma as a degeneration product, but that it is normally formed by active bowel epithelium, and its presence in carcinoma simply shows that the cells have not resigned this form of cell activity.

In four cases of cancer of the rectum which had been removed by operation, the following method of pathological investigation was employed. A strip was cut of the entire piece of bowel removed, passing through the centre of the cancer; this strip was divided into a number of blocks of approximately equal length, microscopic sections of each being made, and the extent and direction of the invasion, together with the involvement of lymph nodes, marked on diagrams.

Chart 1.—EXTENT OF GROWTH IN VARIOUS COATS IN *Case I.*

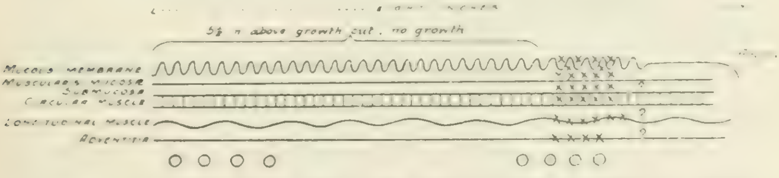
Ulcer measures 1$\frac{3}{16}$ in., lower edge about 1 in. from pectinate line. Invasion of bowel wall, 3 in. Extension in various coats nearly equal, slightly more extensive in plane of longitudinal muscular coat. Extension up and down about equidistant from the edge of the ulcer. Pararectal glands invaded, higher glands not invaded. No distant permeation in any plane.



The divisions 1 to 7 refer to the blocks.
Growth; ⊗ = Growth in gland; O = Uninfected gland.

Chart 2.—SHOWS INFILTRATION OF COATS DEEP TO ULCER IN *Case II.*

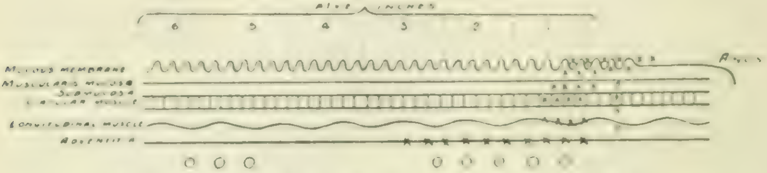
Ulcer measures about 1 in., lower edge about $\frac{3}{16}$ in. from pectinate line. All coats invaded deep to ulcer. Glands not invaded. Extent of invasion of bowel wall not investigated, but no invasion or permeation in strip of wall from $\frac{1}{2}$ in. above the ulcer to the point of section of the colon.



Absence of any growth in length of bowel from point of colon section to within $\frac{1}{2}$ in. of ulcer.
Absence of growth in glands. [illegible] Growth; O = Uninfected gland; [illegible]

Chart 3.—Shows Upward Limits of Extension of Growth in Various Coats in *Case III*.

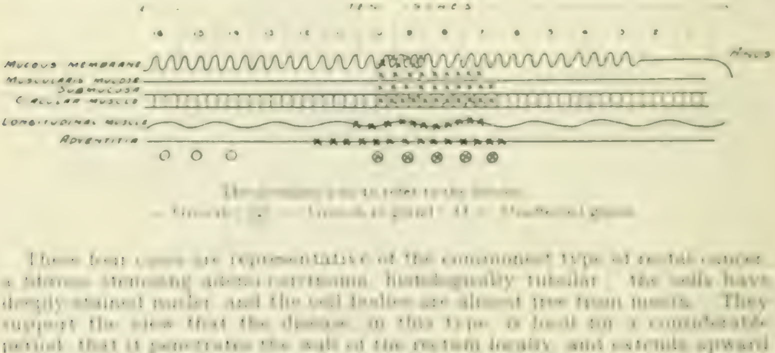
Ulcer measures about ⅞ in.; encroaches on anal canal. Extent of bowel wall invasion upwards is about 2¼ in. above upper edge of ulcer. Greatest extent of invasion in plane of adventitia; invasion of other coats does not extend more than ½ in. above edge of ulcer. No distant permeation in any plane. Glands not invaded.



Measurements approximately. The numbers 1 to 6 refer to the inches.
* = Growth. O = Unaffected gland. ◌ = Not examined.

Chart 4.—Shows Upward and Downward Extension of Growth in All Coats in *Case IV*.

Ulcer measures about ¾ in.; extent of invasion of bowel wall about 2½ in. Greatest extent of invasion upwards in plane of adventitia 1 in. above upper edge of ulcer. Invasion upwards and downwards about equidistant from ulcer. Pararectal glands affected; high glands not affected. No distant permeation in any plane.



The numbers 1 to 16 refer to the inches.
* = Growth. ⊗ = Invaded gland. O = Unaffected gland.

These four cases are representative of the commonest type of rectal cancer, a fibrous, stenosing adeno-carcinoma, histologically tubular; the cells have deeply stained nuclei, and the cell bodies are almost free from mucin. They support the view that the disease, in this type, is local for a considerable period; that it penetrates the wall of the rectum locally, and extends upward and downward chiefly in the planes of the longitudinal muscular coat and the adventitia. Further, that this longitudinal extension is not rapid and wide, but slow and restricted, the greatest distances in the four examples not exceeding one inch, half an inch, two and a quarter inches, one inch, approximately. These distances refer to the preserved specimens; in the fresh specimen they would be slightly greater.

Further, there is no evidence that in this, the common type of the disease, growth cells and cell groups travel by way of the lymphatic plexuses to any great distance beyond the local disease; in particular, that there is no permeation in a plexus associated with the mucous membrane.

This ingenious method of charting the spread of cancer of the rectum will afford reliable information on an important subject when a larger number of cases have been similarly dealt with.

The authors' general conclusions are as follows: (1) Carcinoma of **the rectum habitually remains localized within narrow limits for a** considerable period; (2) Permeation of lymphatic plexuses to a distance beyond the primary site is an exceptional process; (3) Access of the disease to the plane between the bases of the follicles and the muscularis mucosæ occurs by invasion from the submucous plane; (4) Mucin production in the cells is to be interpreted as indicating special activity, and not degeneration; (5) Infiltration is widest in the plane of the longitudinal muscular coat and the cellular tissue outside it; (6) Glandular invasion is sometimes long delayed; (7) Without wide local dissemination, the disease may make its way into blood vessels, a process which may be responsible for distant metastasis.

In spite of the consensus of opinion at the German Surgical Congress in 1909 against the **Kraske Combined Rectum Extirpation,** the number of operations by that method, according to Heller,[3] has increased. From the compiled statistics of the years 1910–1912, Heller reports a mortality of 20 per cent, over two thirds of the fatalities occurring in males. The ideal combined method consists in a primary abdominal dissection of the tumour and a secondary extirpation from below through the coccyx route, with implantation of the oral end of the intestine into the sphincter after the method of Hochenegg. The principal modification of the operation is the formation of an artificial anus after abdominal dissection of the tumour and amputation of the peripheral end of the rectum (Quénu, Hartmann). Heller regards the combined extirpation of the rectum not as a measure of necessity, but as one of choice. It is indicated in carcinoma with its upper borders in the pars pelvina recti, that is, above the muscular diaphragm, because of its direct relation to the lymphatic glands of the upper hæmorrhoidal vessels. He advises it also in spreading tumours, especially with adhesions to the organs of the urogenital tract. The method is contraindicated in generalized carcinomatosis, old age, cachexy, arteriosclerosis and adiposity. The advantage of the combined method, and especially the sacral method, is the possibility, according to the author, of performing a radical operation because of the accessibility of the lymphatic glands, the good exposure of the field of operation of the tumour, the discovery of abdominal metastases, the possibility of mobilizing the colon while conserving the relationship of the vessels, and drawing it down to the sphincter. Finally, asepsis can be retained to the end of the operation. Heller described in detail the method of conserving the vessels, to avoid gangrene of the oral end of the intestine following rectal resection. Section of the superior hæmorrhoidal artery, advised by Rehn, permits the intestine to be pulled down without tension. The ligature is to be placed above the origin of the arteria sigmoidea (Sudeck's critical point), in order to retain the collateral circulation. The anatomical landmark is the level of the fifth lumbar vertebra above the promontorium (Rubesch). In arteriosclerosis, or when the mesosigma is short, ligature of the superior hæmorrhoidal artery immediately below the origin of the left colic artery does not always, according to Sudeck, prevent gangrene. In such cases it is advisable not to draw down the intestine to the sphincter, but to make an abdominal anus.

Primary Melanotic Tumours.—In an exhaustive paper on this subject, André Chalier and Paul Bonnet[3] record an interesting instance and deal with a large series of cases published by others. The personal observation was of a man, aged 48 years, with frequent desire to evacuate the rectum and a sensation that the act was incomplete, and occasional bleeding. Rectal examination revealed a tumour on the posterior surface of the ampulla, which felt hard, had a smooth surface, and was attached by a broad base. It was movable on the deeper structures, and its upper limit could easily be reached with the finger. This tumour was removed without difficulty by posterior incision of the rectum, and the wound was quite healed in ten days. Less than one month later, recurrent nodules in the rectum were noticed, and the liver was found to be enlarged. Metastatic melanotic growths appeared in skin, lymphatic glands, and in the abdominal and thoracic viscera with great rapidity. The patient died eight weeks after the primary operation. Autopsy revealed a number of subcutaneous growths. The peritoneum (parietal and visceral) was covered with melanotic tumours. The liver was enormously enlarged and filled with black masses; practically all the abdominal viscera were studded with dark nodules. The heart and lungs were extensively involved, as also were the brain, and the spinal column and other bones. Both eyes were normal. Histological examination of the primary tumour showed the mucous membrane over it to be normal; a secondary melanotic growth close to the anus was found to have originated in a vein.

Primary melanotic growths in the rectum, as compared with the skin and eyeball, are rare in the human subject, although in some animals, more especially white and grey horses, they are probably more common. The authors give abstracts of sixty-four human cases of this disease collected from medical literature. A review of the facts related in connection with these cases shows that in many the disease has originated in the submucosa; notwithstanding this, the tumour is stated to be frequently of the epithelial type, although in other cases it is definitely classed amongst the sarcomata. In the early stages there is but little pain, and attention is not directed to the rectum until diarrhœa alternating with constipation, sensation of an obstruction in the rectum, or hæmorrhage is noticed. In some cases the tumour becomes pedunculated, and protrudes from the anus after defæcation like an ordinary adenoma, giving rise to hæmorrhage, and sometimes proving difficult of reduction. In advanced cases there may be a discharge of black fluid from the rectum.

In many instances the case was supposed to be the usual columnar-celled carcinoma, its real nature only being ascertained after removal. The points of difference are that the melanotic growth is in the early stage covered by mucous membrane, it is harder than columnar-celled cancer, it tends to reproduce itself in several isolated nodules rather than to spread round the circumference of the bowel, it does not for a long time tend to produce obstruction, and on inspection of it, when prolapsed or by speculum, the characteristic colour may be seen.

In a few cases patients have lived for many years without recurrence after the tumours have been removed, while in many the spread of metastatic growths has been extremely acute. The treatment is similar to that required for columnar-celled carcinoma.

References.—[1]*Trans. Amer. Proctol. Soc.* 1913, 86; [2]*Brit. Jour. Surg.* 1913, i, 173; [3]*Surg. Gyn. and Obst.* 1913, i, 381 (abstr.); [4]*Rev. ae Chir.* 1913, i, 235 *et seq.*

RECTAL FEEDING.

Robert Hutchison, M.D., F.R.C.P.

From observations on patients, Mutch and Ryffel[1] are of opinion that the use of proteins in rectal feeding is valueless. They recommend for general employment a 6 per cent solution of **Glucose** in tap-water, which is isotonic with blood; 15 oz. or more may be given to an adult four times a day, the rectum being thoroughly washed out once daily with normal saline.

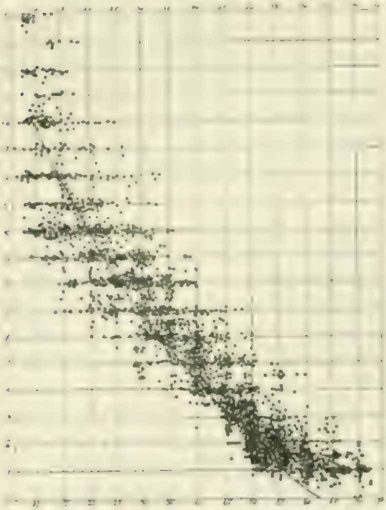
Rendle Short and Bywaters,[2] who have also investigated the subject very elaborately, agree that little if any nutriment is absorbed from a rectal injection of albumin or peptone. On the other hand, they find that some absorption of nitrogen can take place if given in the form of amino-acids. Amongst their final conclusions are the following: Modern physiological opinion holds that proteins are absorbed principally as amino-acids. The failure of the rectum to absorb ordinary nutrient enemata is largely due to the fact that peptones are given instead of amino-acids. Chemically prepared amino-acids, or milk pancreatized for twenty-four hours so that amino-acids are separated, allows of a much better absorption of nitrogenous foodstuffs from the rectum, as demonstrated in five cases by the high nitrogen output in the urine. The low output of ammonia nitrogen shows that this high output was not due to the absorption of putrefactive bodies. The rectal washings were not offensive. Dextrose is much better absorbed than lactose, and relieves the acidosis of starvation. Fat is not well absorbed. Scarcely any of the fat of ordinary milk enemata is retained. The best nutrient enema consists of **Milk Pancreatized** for twenty-four hours, with 5 per cent pure **Dextrose.**

References.—[1]*Brit. Med. Jour.* 1913, i, 111; [2]*Ibid.* 1361.

REFRACTION, ERRORS OF.

A. Hugh Thompson, M.D.

Accommodation.—The accompanying charts (*Figs.* 50, 51, 52), from a paper by Ernest Clarke,[1] show the result of testing the near point (P) of 1000 individuals, with different varieties of refraction, in whom the error had been corrected prior to the determination of P. The curved line is Donders' average, or mean near point line. The figures above represent ages, and those to the left dioptres. The results fairly agree with a similar investigation undertaken by Duane a few years ago.[2] From both, the chief lesson to be learnt is the wide difference in the range of accommodation existing in different individuals of the same age. As will be seen from the chart, some children of fifteen have 17D of accommodation, while others have only 7D. At the age of forty the power varies from 3·5 D to 8 D. The differences must be due partly to variations in the rate at which the crystalline lens becomes hardened, and partly to variations in the power of the ciliary muscle. This latter factor has been ignored by some writers;[3] but by those who have much to do with testing refraction in children it will not be doubted that it is the principal factor in their case. To a healthy and well-nourished child under fifteen, a simple hypermetropia of 2 or 3 D is a matter of practically no importance; but with ill-health and under-nourishment the reserve power of accommodation decreases, especially in a state of fatigue, and in default of being able to improve the conditions of life, the school oculist frequently finds it necessary to prescribe convex glasses. In the case of older patients the differences are not less marked, and by Clarke are correlated with other varying incidents of increasing age. In illustration he takes three men, each fifty years old. One may have grey hair, wrinkled skin, and sclerosed arteries. His accommodation will probably need helping to the extent of 2·5 D or 3 D. Another may have none of these marks of age, and might pass for thirty-eight. He may probably be able to read easily without glasses. A third may look fifty, and need the average amount of correction for his age —1·75 or 2 D. All this tends to show that the prescribing of glasses for presbyopia is something more than a merely mechanical routine.



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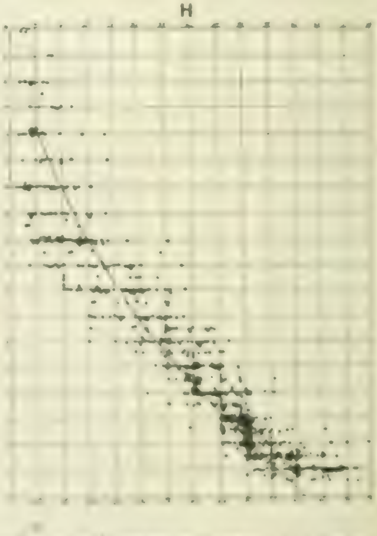

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Is Myopia Decreasing?—To this question Risley, judging from statistics derived from his own private case books, replies in the affirmative. Already, in 1894, when he wrote the article on school hygiene in Norris and Oliver's text book,[1] he found that this had been the case in Philadelphia since the more general correction of refractive errors which had been carried out during the preceding twenty years. In the present paper[5] he compares the statistics of the years 1894–6 with those of the years 1910–1912. In the former period, out of a total of 1421 eyes, the percentage of myopia was 14·07. In the latter period, out of a total of 876 eyes, the percentage of myopia had fallen to 11·21. The tables show, further, a decrease, not only in the proportion, but in the severity of the myopia, the percentage of the higher grades falling with more or less regularity with the succeeding years, while the lower grades of less than 3 D steadily advance, not in actual numbers but in relation to the whole number of myopic eyes. It would be interesting to know whether the attention which has been paid to the refraction of London school children in recent years has yet been attended by similar encouraging results. *A priori*, one would expect that it would have, for as was shown by some statistics of the present writer's some years ago,[6] children who suffer from hypermetropic astigmatism in early school life tend to become myopic later on, more than normal children. How far the correction of refractive errors has antagonized this tendency, it is as yet probably too early to judge, as far as London is concerned. The subject was discussed at the 1913 meeting of the British Medical Association, and brought out a considerable divergence of view among those present.[7]

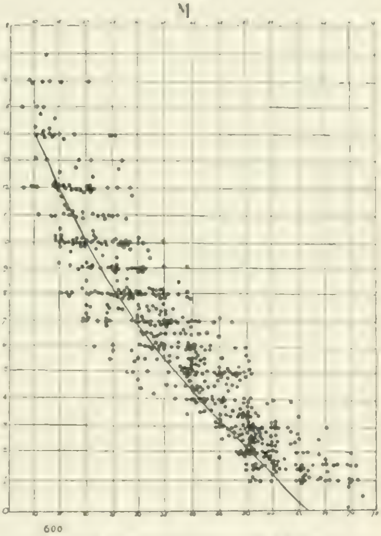


Fig. 52.—Myopic cases. (*J. Clarke.*)

REFERENCES.—[1] *Med. Press. and Circ.* 1913, i, 333; [2] *Med. Ann.*, 1910, 524; [3] *Fuchs' Textbook of Ophthalmology, transl. Duane*, 4th ed., 820; [4] ii, 353; [5] *Jour. Amer. Med. Assoc.* 1913, ii, 1169; [6] *Brit. Med. Jour.* 1906, ii, 190; [7] *Ibid.* 1913, ii.

RELAPSING FEVER. (*See* SPIROCHÆTOSIS.)

RENAL EFFICIENCY, ESTIMATION OF.

Francis D. Boyd, M.D.

Tests of Renal Activity.—Since Rowntree and Geraghty's original communication on the estimation of renal function by the injection of *phenolsulphonephthalein*, a large number of communications have appeared on the subject.

The method is simple and can easily be carried out by the practitioner. The patient drinks 200 to 400 c.c. of water twenty minutes before the injection. One c.c. of the solution, containing 6 milligrams of the phthalein, is injected deeply into the muscles of the lumbar region, and the patient is instructed to empty the bladder at the end of one hour and ten minutes and again at the end of two hours and ten minutes. No account need be taken of the time of appearance of the pigment, main reliance being placed on the quantity excreted. In cases of urinary obstruction the catheter must be employed. The urine voided in the first hour is poured into a one-litre measure, water added to 200 c.c., and rendered strongly alkaline by the addition of 10 c.c. decinormal caustic soda solution until the maximum red colour is attained. Water is now added up to the mark, and the mixture shaken and filtered to remove phosphates. The colorimeter is filled with the red-coloured clear filtrate, the scale read, and the percentage of excreted pigment obtained. If the urine contains 40 to 60 per cent of the injected phthalein strongly alkalized and diluted to one metre, the ordinary pigment of the urine does not disturb the estimation. The first hour after injection, 43 to 70 per cent—usually about 50 per cent—of the pigment is excreted; during the first two hours, 70 to 90 per cent. Excretion is therefore practically complete after two hours.

A diseased kidney shows a very marked decrease in excretion during the first two hours. At the end of four hours even a diseased kidney will have excreted most of the pigment. It is, however, sufficient to watch the patient for one or at most two hours. In cases with only slight changes in the kidney function, these can be estimated with efficiency at the end of an hour. In acute nephritis, excretion is noticeably decreased; in parenchymatous nephritis of some standing, excretion is always noticeably under the normal. If a diminution worthy of mention be present, it is claimed that there is always a definite lesion in the kidney. If only a trace were excreted in four hours, the prognosis is extremely unfavourable, even if no other sign of uræmia be present.

When the test is used in conjunction with ureteral catheterization, the injection is made intravenously, and the urine collected at two separate fifteen-minute intervals, the time of collection beginning with the appearance of the drug on the first sight. When the kidneys are functioning smoothly, and the function is being measured simply to determine the efficiency of the kidney remaining after a nephrectomy of its fellow, a collection of fifteen minutes is usually all that is necessary. If the second kidney is normal, a high excretion of phthalein will occur sufficient to indicate its efficiency. When, however, both kidneys are diseased, or when functional estimations are being made for the purpose of diagnosis, a comparison of the two kidneys being desired, periods longer than fifteen minutes must be employed. For short periods the kidneys normally vary very much in the relative amount of work which each one performs, but if the time collection is one hour the variation will be slight. Phthalein is eliminated almost, if not entirely, by the tubules, so the presence of glomerular disease would not necessarily cause decreased output. The glomeruli are, however, rarely gravely diseased without considerable resulting damage to the tubules, and the greater the tubular injury, the more marked the phthalein decrease. In chronic interstitial nephritis, individuals with low phthalein excretion are occasionally seen, in whom no evidence of uræmia is present, and for this reason there is a tendency to doubt the accuracy of the test. Subsequent autopsy findings, however, in each case proved the existence of very advanced chronic nephritis.

Lactose is excreted by the kidneys, following its intravenous or subcutaneous injection. Experimental work seems to show that lactose is excreted by the glomeruli and not by the tubules and it is thought to determine the condition of the vascular apparatus of the kidney by the estimation of the excretion of lactose in the urine. Two grams of lactose are dissolved in 20 c.c. distilled water, and the solution is carefully sterilized and injected. The urine is collected from hour to hour. Normally, the excretion of lactose in the urine persists from four to six hours. Where the glomeruli are involved in the disease, excretion may be very definitely prolonged.

Normally the kidney is able to excrete the *salt* of the food which is in excess of the requirements of the body. In diseased conditions there may be salt retention and with it œdema. In diseases of the kidney, especially where there is tubular involvement, the capacity for salt excretion may be found defective; on giving excess of common salt by the mouth the salt content of the urine is not augmented and increased œdema results.

If 7½ gr. of *iodide of potassium* be administered to a healthy individual, it will be recognizable in the urine in a very few minutes, and the total quantity should be excreted within about sixty hours. Potassium iodide is eliminated by the tubules of the kidney, and where the tubules are implicated in the disease, the elimination of the iodide is greatly delayed, in some cases the time being doubled or even trebled.

Thomas gives preference to the *indigo carmine* test in estimating kidney sufficiency or insufficiency, for there is no necessity for ureteral catheterization with its many and obvious disadvantages. Conclusions should be drawn, not alone from the time of onset of elimination of the dye, but due consideration must be given to the intensity of the colour reaction. Although the exact time limit for functionally efficient kidneys is not yet definitely determined for the excretion of the dye, as a dark blue it should be placed at twenty minutes, while as a light blue, fifteen minutes should be the time limit. Any prolongation of time beyond those limits shows serious interference with functional activity.

Krotoszyner and Hartmann discuss a lengthened experience of *chromocystoscopy* in the estimation of renal function, and find that in the hands of a critical observer the test is valuable for the estimation of absolute or total renal function, especially when estimation of relative function through ureteral catheterization is not feasible.

Estimation of Nitrogen.—Nitrogen retention is always a grave phenomenon when present in renal disease, and it is claimed that important prognostic data can be obtained by estimating the incoagulable nitrogen of the blood serum. In cases of uræmia, this is present in higher proportion than in the normal individual. In renal disease in individuals with more than 2 grams of nitrogen per litre of blood, the prognosis is very grave.

By the systematic employment of these tests, it is thought to differentiate various pathological lesions of the kidney. Delayed lactose excretion, with a normal iodide and urea excretion, points to a lesion of the glomeruli, which is usually accompanied by general arteriolar disease, with hypertension, and exhibits the well-known phenomena of this type of clinical picture. Delayed iodide and chloride excretion, with normal lactose and urea excretion, is found especially when the tubules are involved. Œdema, copious albuminuria, and abundant tube casts are usually present. Cardiac hypertrophy and hypertension are not prominent phenomena. Uræmia is not a probable ending. Urea retention is rarely seen in pure form. An acute nephritis is frequently of a mixed type, and may proceed to healing, or pass into a chronic vascular, tubular, or uræmic type.

Rowntree, in the discussion at the American Conference, made special reference to the prognostic value of studies of renal function. Functional studies, he points out, reveal only the excretory capacity of the kidney, but do not establish the diagnosis or settle the prognosis. Still, they should be used as a matter of routine, and the phthalein and lactose test and the estimation of nitrogen retention are of considerable prognostic importance.

REFERENCES.—Rowntree and Fitz, *Arch. Internat. Med.* 1913, i, 258; Rowntree, Fitz and Geraghty, *Ibid.* 1913, i, 121; Barnett, *Med. Rec.* 1913, i, 609; Cabot, *North-Western* [illegible]; Autenrieth and Funk, *Münch. med. Woch.* 1912, 2613; Pepper and Austin, *Amer. Jour. Med. Sci.* 1913, i, 254; Geraghty, *Jour. Amer. Med. Assoc.* 1913, i, 191; Goodman, *Ibid.* 1913, ii, 15[illegible]; Matthews, *Edin. Med. Jour.* 1913, ii, 15[illegible]; Herringham and [illegible], *Quart. Jour. Med.* 1913, July, 403; Thomas, *Jour. Amer. Med. Assoc.* 1913, i, 16[illegible]; [illegible] and Hartman, *Ibid.* 156.

RETINA, DISEASES OF. *A. Hugh Thompson, M.D.*

Obstruction of the Central Artery.—Some years ago the present writer published a summary of the views then current as to the causes of this condition.[1] What was then said still holds good in the main, but the subject has been considerably advanced in the interval. *Embolism*, at one time the sole recognized cause of the condition, has for many years been regarded as only an occasional one. In 1900, Reimar[2] doubted whether it ever occurred, because the diagnosis had never been confirmed by the pathological examination of a recent case. The opportunity for such examination must obviously be exceedingly uncommon, as such eyes do not call for excision; but a case in point is now to hand in which a post-mortem was secured four days after the occurrence of the embolus.[3] A clinical observation of Beatson Hird's[4] may also be cited in this connection. The patient was a man with old endocarditis

PLATE XLI

RETINAL VASCULAR DISEASE MICROSCOPICAL APPEARANCES

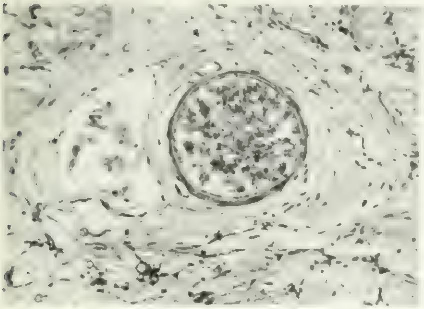
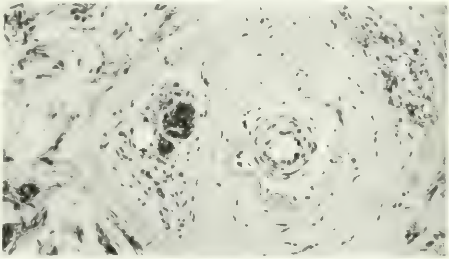


Fig. A.—The normal central vessels. The artery scarcely has a separable adventitia, but the muscularis, though thin, is well developed. The endothelium seems to rest on the elastic membrane without the intervention of any other tissue. The sectional area of the vein is somewhat larger than that of the artery. The vessel is little more than an endothelium-lined space in the tissues. There are no muscular elements in the wall. × 120.

Fig. B.—Endarteritis in the central artery. The change is essentially a new formation of tissue on the inner aspect of the elastic lamina, which is thrown into folds. The lumen is much encroached upon, but is still lined with a fairly even layer of endothelial cells. The succeeding layers are fibrillated, and contain a fair number of elongated nuclei. The outer layers are also slightly fibrillated, but have a more homogeneous aspect and are less cellular. There is no disorganization of the new tissue. The muscular coat is atrophied. The section passes through the upper part of an organizing thrombus in the vein, and a little collateral channel is seen, which will take part in the re-formation of the vein lumen. × 120.



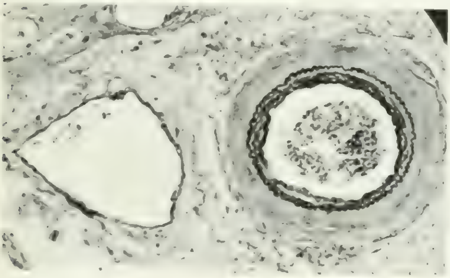


Fig. C.—Endarteritis in the central artery. Stained with Weigert's elastic-tissue stain. The elastic membrane is normal and unthickened. Within it there is a quantity of new-formed tissue, among which new elastic fibres are visible. × 120.

Fig. D.—A more advanced example of the same condition. Stained with Weigert's elastic-tissue stain. The elastic membrane is enormously thickened, and on its inner aspect there is a new formation of elastic fibres, some of which are comparatively coarse, forming more or less complete new membranes within the old. There is some degeneration of the outer layers of the new tissue. × 120.

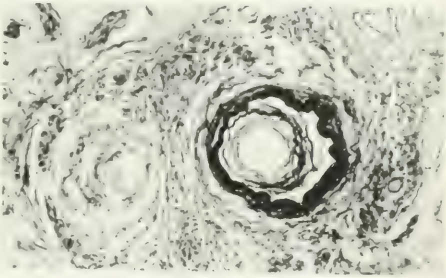


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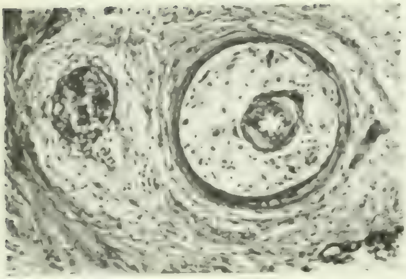
PLATE XLII.

RETINAL VASCULAR DISEASE [illegible]



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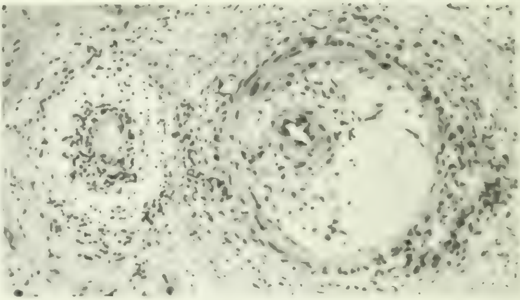
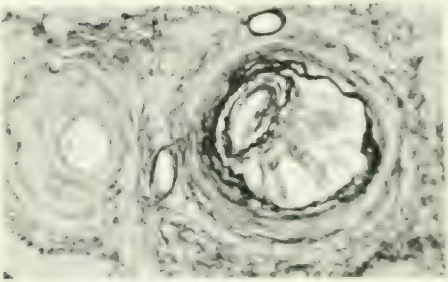


[illegible] lumen is reduced to very small dimensions. The cells [illegible] are still preserved, but further out there is considerable breaking down, with the formation of cavities containing [illegible]. There is some [illegible] iteration of the perivascular endothelium. The wall of [illegible]



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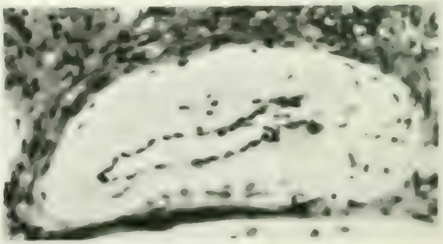


[illegible]

and the embolus could be seen ophthalmoscopically as a round whitish body at the bifurcation of the superior temporal artery. On digital pressure being applied to the eyeball, the whitish body could be seen to throb. The history of this case is interesting from the point of view of treatment. The obscuration of the sight of the eye occurred suddenly, and was at first complete. Immediately, the patient rubbed the eye vigorously, and in about ten minutes the sight partially returned, though he could see nothing below the horizontal mid-line. Presumably, immediate massage was successful in dislodging the embolus from a place where it obstructed the main artery to one where it only obstructed the upper branch.

A far more common cause of obstruction is endarteritis, about which we shall have more to say presently. A third possible cause is *spasm* of the muscular walls of the artery; but about this there is much difference of opinion. Some writers have claimed actually to see with the ophthalmoscope the alternate contraction and expansion of the central artery; but others have supposed that this condition is due to a stagnant current of blood in which the corpuscles are agglutinated into sometimes larger, sometimes smaller, masses. On this theory, these cases are really due to endarteritis. Instances are recorded however, which point very strongly to obstruction occurring as the result of reflex spasm.

As to the other causes formerly assigned in these cases, they may be ignored. One of them was hæmorrhage into the nerve sheath. This, doubtless, sometimes happens; but how it should give rise to the appearances typical of obstruction it is hard to imagine. Another was thrombosis, and this doubtless frequently occurs, but always, one may say, except in septic cases, secondarily either to an embolus or to disease of the vessel wall, so that it would be an error to cite it as a primary cause.

To return to *endarteritis*, which is now generally acknowledged to be by far the commonest cause of obstruction. A local swelling of the intima may reduce the lumen of the artery to such an exceedingly narrow channel or slit that the resistance offered to the onward passage of the blood is very great. Consequently, any temporary diminution of blood pressure, from whatever cause, may be sufficient to allow the vessel walls in this particular spot to come into contact, and so stop the flow of blood past it, a state of things which might either be transient or permanent. If the former, the condition would very probably recur—hence the frequency of a history of preceding transient attacks in cases of complete obstruction. The accompanying figures from an important paper by Coats[7] illustrate the microscopical appearances in cases of endarteritis of the retinal vessels. (*Plates XLI, XLII. Figs. A* to *H.*)

Detachment of the Retina.—Vail, of Cincinnati,[8] sent out 400 letters to American oculists, enquiring from each his experience of the treatment of non-traumatic detachment of the retina. He received 281 replies, the cumulative effect of which is somewhat startling:

250 out of 281 never cured a single case. Many have had promising temporary results, but in the end failure. Of the remainder, 25 met with a single cure each, 4 met with two cures, and 2 met with four cures, making in all 41 cases reported cured. Two of these cases had detachment due to albuminuria in pregnancy, and they were cured after abortion. In about half the remaining cases the "cure" is not convincing from the records submitted. Commenting on these facts, Vail says: "In the light of such overwhelming defeat in our attempt to cure this disease, and after having used the knife to puncture and transfix, the cautery to burn holes, the scissors to cut windows, the confinement in a dungeon of darkness, with dry diet, purges and sweats, the potassium iodide and tight bandage, and after all and everything has been tried, to have the prospect of cure reduced to less than one out of 1000 cases, I say the treatment is barbarous and even brutal." Having said so much, Vail proceeds to propound a new theory of the causation of detachment of the retina and a new treatment. The theory is that there is a paralysis of the secretory functions of the ciliary processes, which causes a diminution in the intra-ocular fluid and a consequent contraction of the vitreous. The treatment based on this theory aims at the re-establishment of the secretory function. Acting on this idea, Savage, of Nashville, has attempted to effect the desired object by "alkalinizing" the intraocular juices. This he does by means of subconjunctival injections of **Sodium Citrate**, 15 drops of a 5 per cent solution, repeated at intervals of a week. The immediate results from this treatment have been very remarkable, according to Savage; but as in this disease immediate results count for comparatively little, it will be well to await further experience before judging of its value.

REFERENCES.—[1]*Ophth. Rev.* 1912 (in MEDICAL ANNUAL 1913); [2]*Arch. f. Augenheilk.* lxxvii, [illegible]; [3]*Klin. Monatsbl. f. Augenheilk.* xlix, pt. 2, [illegible]; [4]*Ophthalmoscope*, 1912, [illegible]; [5]*Trans. Ophth. Soc.* 1912, [illegible]; [6]*Ann. Ophthalmol.* 1912, Jan.

RHEUMATIC FEVER. (*See also* RHEUMATISM IN CHILDHOOD.)

Herbert French, M.D., F.R.C.P.

TREATMENT.—Relapses or second and later attacks of acute articular rheumatism constitute one of the most serious features of the malady, for in each there is grave danger of cardiac complications, even though the first attack has been recovered from without any such consequences. It is therefore a matter of great practical moment to discover, if possible, whether these recurrences are due to entirely separate infections from without, or whether the patient continues to harbour the infecting organism after the first attack, so that later ones are not re-infections, but recrudescences of what has been latent in the interval, as in malaria. Beattie[1] has endeavoured to throw light upon this point by bacteriological investigations of the synovial membranes of joints, both of patients who have died after former acute rheumatic disease, and of rabbits who have recovered after suffering from experimental acute rheumatism. His results, so far as they go, point to the rheumatic diplococci being able to persist quiescent in the synovial membranes for long periods after an attack of acute rheumatism. He concludes that recurrent attacks of acute rheumatism are therefore not separate infections, but true recrudescences or relapses of the first. If so, there is need of devising treatment which will kill off all the latent germs in the joints and elsewhere. What form this interval-treatment should take, Beattie is unable to say, but he suggests that if salicylates will not suffice, and if atoxyl or other allied effective anti-protozoal drugs cannot be found, treatment by **Vaccines** prepared from the infecting organism of acute rheumatic cases might well be tried.

Considerable controversy has taken place of late over the question of whether or not **Salicylates** should be pushed to a high dose in cases of acute rheumatism, as advocated by Lees, who gives up to 400 gr. a day in ten separate quantities, rather than less frequently in proportionately bigger amounts at a time. Many objections have been raised against this procedure; the more important have been investigated critically by Miller,[2] whose analysis concerns 124 cases, none of which were under his own direct care, but in all of whom salicylates were pushed more or less. His conclusions are all in favour of the salicylates. He shows that progressive increase in the dose leads to corresponding increase in the amount absorbed; that the vomiting which salicylates have been accused of producing is primarily due to excessive cardiac dilatation resulting from the acute rheumatism itself; this fact, however, makes it advisable not to push the dose of salicylate when severe cardiac dilatation is present; that acid intoxication is not to be attributed to the salicylates if they are given in the right way; that the fatalities which have been attributed to salicylates are not due to the drug but to the rheumatic myocardiopathy; and that big doses of salicylates do not predispose to relapses of the rheumatic manifestations. He is clearly in favour of giving big doses of salicylates, together with bicarbonate of soda, in the way advocated by Lees.

REFERENCES.—[1]*Edinb. Med. Chir. Jour.* 1913, 157; [2]*Quart. Jour. Med.* 1913, July, 519.

RHEUMATISM (in Childhood). *Frederick Langmead, M.D., F.R.C.P.*

The frequency and extreme importance of rheumatism in early life is gradually gaining recognition. F. J. Poynton[1] compares it with tuberculosis, pointing out that it may be neither acute nor febrile. For this reason he prefers the term "rheumatism" to either "acute rheumatism" or "rheumatic fever."

ETIOLOGY.—He thinks the disease is especially rife when a period of cold damp weather follows abruptly after one which is dry and dusty. *Heredity* is an important factor. The incidence of the disease increases with each year of life until the tenth to twelfth year, and then declines. Although rarer in the first few years, he has collected 50 cases of his own at or under five years of age. Females are more often attacked than males, and of 500 consecutive hospital cases, including those of chorea under his care, 319 were females and 181 were males. He is convinced that cold damp houses are very detrimental to the rheumatic child, as also are low-lying damp neighbourhoods. As evidence that direct infection can occur from mother to fœtus, he quotes a case of his own. A child was born at full term, the mother having suffered from severe rheumatism during pregnancy. On the second day, the child died; its mitral valve was found to be actively diseased, and great numbers of strepto-diplococci were recovered from the vegetations.

He states with conviction that the avenue of infection is through the tonsils, for a diplococcus similar in all respects to that isolated by Paine and himself can be obtained from acute rheumatic angina. Unhealthy tonsils are very common in rheumatic children. Again, a sore throat may precede an attack of rheumatism in a most convincing way. In 500 cases this history was obtained in 137, and yet it is unlikely that the throat need be actually sore. Disease of the teeth and gums, in his experience, is not a prominent factor. Poverty is another predisposing cause, and insanitary houses also favour it. He regards the arthritis of scarlet fever as true rheumatism; the post-scarlatinal cases have the same course in after years as rheumatism arising independently.

The writer's[2] investigations as to the incidence of rheumatism among school children bear out Poynton's contentions as to its prevalence, and the path of infection. The percentage of children definitely rheumatic, out of a total of 2556, was 5·2 for children of all ages or 6·83 for children in the senior departments. Out of 133 children classed as rheumatic, 115 showed some sign of cardiac disorder. An overgrowth of the tonsils or pharyngeal mucosa occurred in 43·6 per cent of the rheumatic children, and this was sufficient to warrant operative interference in 27·8 per cent. On the other hand the usual percentage of school-children requiring operation for tonsils and adenoids is 7 or 8. By a study of 75 cases of chorea, W. P. S. Branson[3] comes to much the same conclusion as to the route of infection. Of these 21·2 per cent had already been operated upon for the relief of "tonsils and adenoids." Eighty-three per cent showed evidence of nasal or pharyngeal inflammation. In 62 per cent the tonsils were enlarged or had been removed, in 63 per cent the tonsillar glands were enlarged, and in 50 per cent inflammation of the nasal passages existed. From these data he infers that the commonest avenue of rheumatic infection is the tonsil, and next to it the nose.

CLINICAL MANIFESTATIONS.—Poynton summarizes these as follows: (1) Articular pains, arthritis and teno-synovitis, (2) carditis, (3) chorea, headache, migraine, (4) pleurisy, (5) subcutaneous nodules and periostitis, (6) tonsillitis, (7) erythemata, (8) anæmia, (9) hyperpyrexia (very rare); and among other lesions adds nephritis, peritonitis, myositis, and possibly appendicitis, probably otitis media, meningitis (very rare), neuritis (interstitial), myelitis, disseminated sclerosis (?), mastitis (uncertain), acute pulmonary oedema and bronchopneumonia.

bronchitis (?), phlebitis, venous thrombosis, perivascular fibrositis. M. R. Bass[1] records a case of orchitis associated with erythema nodosum and acute torticollis.

The disease in childhood, according to Poynton, differs from its less characteristic form in adults in the following ways: The manifestations are more varied and more numerous; the articular lesions, though frequent, are less severe; heart affections are more frequent, and rheumatism for this reason more fatal; multiple cardiac lesions are commonly met with; nervous symptoms, notably chorea, are more frequent, as also are subcutaneous nodules; sweating is less frequent; anæmia is more profound; there is a greater tendency to drift into the rheumatic state; hyperpyrexia is very rare. He speaks of a redness and swelling of the great toe, even in young children, resembling the gouty toe of the adult, and of the development of ganglia on the dorsum of the wrist as the result of tenosynovitis.

The most frequent *cardiac* lesion is dilatation, and the most severe general carditis. Of the endocardial lesions, mitral disease comes first in point of frequency, and combined mitral and aortic disease next. Myocardial damage out of proportion to, or even without, valvular or pericardial affection, demands our close attention. In it the action of the heart is irregular, the cardiac dullness increased, and the first sound short. The presence of submiliary nodules in the *a-v* bundle may produce a partial or complete heart-block.

Concerning *chorea*, 122 out of 217 cases showed evidence of obvious heart disease and other rheumatic manifestations. In 28 more there were arthritis and muscular pain; in 22 more, cardiac dilatation. Ten followed sore throat; 20 of the remainder gave no history of the cause, but 2 came later for acute rheumatism. Fifteen were attributed to fright and shock, but in some there appeared to be no relationship between the two events, and 2 were certainly rheumatic in later life. Eight were attributed to strain at school. The onset may be gradual, and for weeks irritability, inattention, night-terrors, fidgets, and headache may alone be noticed. The writer[2] has pointed out that long before chorea is recognizable by its erratic movements, the child's school-work deteriorates. It becomes inaccurate, slovenly, and uneven, defects which are best shown in the writing and arithmetic. The letters and figures are badly formed, irregular and wavy, crowded in some places, spaced in others, and sloping at various angles. When chorea is not obvious, it may be suspected by certain ocular phenomena. The pupils are frequently dilated, and the action of the iris abnormal. Hippus, inequality increased by accommodation or reaction to light, and alteration in their shape—the circular orifice becoming oval or irregular—may occur. One or other may also become excentric. Poynton states that chorea is often associated with the early stages of mitral stenosis, particularly when the chorea is persistent or recurrent.

In his 500 consecutive cases, the frequency of the various manifestations when the patients were first seen was as follows: 350 complained of cardiac symptoms, 248 of arthritis and pains, 245 of chorea, 36 showed nodules, 36 rashes, and 137 sore throat.

PROGNOSIS.—Poynton formulates certain prognostic indications. An acute attack in a very young child is always cause for anxiety if pericarditis develops. Cases which begin acutely with diarrhœa and a rapid appearance of many manifestations are always dangerous. Fragile children who have a definite rheumatic inheritance—particularly if this be derived from both parents—are subject to a very destructive form of carditis. The supervention of severe chorea upon a severe carditis is usually fatal. Nodules indicate severe heart disease. Pericarditis in a case of recurrent rheumatism with severe cardiac damage is often a terminal event, and develops in practically all the fatal first attacks. The tendency of rheumatism to recur introduces a factor which makes prognosis difficult. Speaking of the outlook in cardiac lesions he gives the following indications: Mitral incompetence, if slight and well compensated, gives a favourable outlook, but with a large feeble heart and symptoms of breathlessness and asystole, a gloomy one. Slight mitral stenosis is compatible with a long and useful life, but progressive and severe mitral stenosis in childhood is of grave import for the future. Combined aortic and mitral disease is very serious when the aortic lesion is well marked; when this is slight the case falls into line with those of mitral incompetence. Primary aortic disease of severity is rare, but the outlook grave. External pericardial adhesions, which are almost always associated with a large heart, precordial bulging, and signs of asystole on exertion, are very serious. Many cases of myocardial weakness without valvular disease, though obstinate, eventually do well; some of greater severity are most intractable and may lead to permanent invalidism. Some cases of pericarditis make excellent recoveries, but the majority show considerable valvular damage also, and must be judged accordingly. The cardiac muscle is very likely to be weak in such cases. Persistent tachycardia after rheumatism in childhood is a serious event; it is likely to be associated with progressive mitral stenosis. Persistent anæmia is serious also.

TREATMENT.—As this author points out, *preventive* treatment holds out the greatest hopes for the future. He recommends **Enucleation of the Tonsils** if they are large, and particularly if obviously diseased. Although this will not certainly prevent another attack, it diminishes the likelihood of it and improves the general health. Dawson considers that the first essential of rational treatment of the rheumatic infection is restoration of the upper air passages to a healthy condition, and that irrigation and thorough cleansing of the nasal passages, combined with antiseptic treatment of the nose and pharynx, should be a routine item of antirheumatic treatment. Few will disagree with Poynton, who says that rheumatic children need **Warm Clothing**. He lays no stress upon diet.

With regard to the treatment of the disease when manifestations are present, he issues a warning against the rash use of large doses of

Salicylates in delicate rheumatic children, having seen toxic symptoms attend their administration. He prefers giving 15 to 20 gr. in the twenty-four hours, but has found it in these doses of little value as a prophylactic measure. He acknowledges the difficulties experienced in determining the length of time during which **Rest** should be insisted upon, but with the appearance of a steady temperature and of the absence of evidence of active lesions, advises a forward policy.

He regards **Vaccine Therapy** as still in the stage of investigation, and employs small doses, beginning with 1,000,000 organisms and testing each advance. Sometimes it has seemed to do good, at other times it has proved disappointing.

In the treatment of *chorea* the writer emphasizes the importance of **Rest**, both to body and mind, and the avoidance of all occasion for excitement or fear. Little reliance can be placed on the many drugs which are employed, but **Sodium Salicylate** has a special sphere of usefulness, for although its effect on chorea may be slight, it treats the underlying condition, and may prevent further rheumatic manifestations. If there is a rise of temperature, salicylate is imperatively called for, but large doses have not appeared to do more good than moderate ones. **Arsenic** is not recommended, for whilst its good effects are indefinite, its ill effects are sometimes only too clear. To obtain sleep in maniacal or very restless forms of chorea, **Chloral** and **Bromides** are valuable, especially if combined with **Warm Packs**. The treatment by **Massage**, and re-educative **Exercises** are of great importance, and by their means recovery may be hastened considerably.

REFERENCES.—[1]*Pract.* 1913, i, 380; [2]*Lancet*, 1911, ii, 1133; [3]*Brit. Med. Jour.* 1912, iii, 1429; [4]*Jour. Amer. Med. Assoc.* 1913, i, 1608; [5]*Brit. Med. Jour.* 1913, i, 1261.

RHEUMATISM, MUSCULAR. (*See* FIBROSITIS.)

RHEUMATOID ARTHRITIS. (*See* ARTHRITIS, RHEUMATOID; SEMINAL VESICLES.)

RHINOPHYMA. (*See also* NOSE.)

E. Graham Little, M.D., F.R.C.P.

Bordier[1] recommends **Electrolysis** for the hypertrophic masses which cause the essential disfigurement of this condition. Three platinum-iridium needles, parallel to each other, are introduced into the tumour at a level two millimetres below that of the natural contour to which it is desired to reduce the nose. The middle needle is attached to the positive pole and the two others to the negative. If the patient is hypersensitive, an injection of novocain-suprarenalin may be given. The amount is increased progressively until about 40 milliampères are reached; and the operation may be considered achieved when the tissues assume a grey colour between the needles. The treated area becomes blackened within twenty-four hours, and within fifteen days separates by dry gangrenous detachment, leaving a remarkably good cosmetic result.

REFERENCE.—[1]*Presse Méd.* 1913, 575.

RHINOPLASTY.

Priestley Leech, M.D., F.R.C.S.

Hollander[1] of Berlin describes a third method of rhinoplasty. Where the face is already scarred he thinks the Indian method of rhinoplasty is the one to be chosen; but when the defect in the nose is isolated, it is better to take the skin flap from some other part than the forehead. He takes the skin from the chest, as in the illustrations (*Plates XLIII, XLIV*). The flap is protected from the exhalations from the mouth by being wrapped in moistened gauze and then in a waterproof material until the flap is divided; after this the lower portion may be turned back to cover the upper part of the wound over the sternum. This is not so applicable in men with hairy chests. Rosenstein[2] describes another method, where either skin alone or skin with a thin layer of bone may be used. The flap is taken from the skin over the chest, and implanted into an incision under the chin, and when the flap has taken it is divided and turned up over the nose (*Fig. 53*). This seems a very simple and ingenious method, and obviates the uncomfortable fixing of the arm in one position.

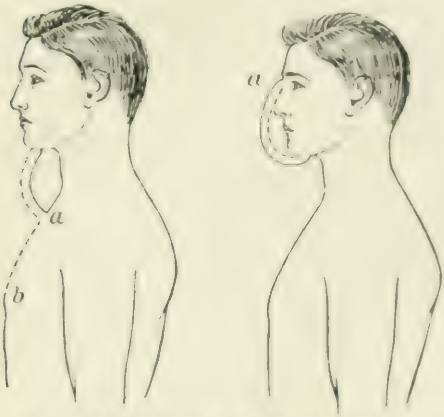


Fig. 53.—Rhinoplasty, with the flap from chest (Rosenstein's method). Flap cut from chest and carried up and fixed under the chin; later it is divided and turned up over nose.

References.—[1]*Berl. klin. Woch.* 1913, 1073; [2]*Ibid.* 1913, 590.

RINGWORM.

E. Graham Little, M.D., F.R.C.P.

Diagnosis.—Recent additions to our knowledge of this subject are reviewed by Adamson[1] and summed up in the following headings: (1) The inclusion in the group of body ringworms of certain eruptions due to infection by ringworm derived from animals, particularly from the dog, the cat, the horse, and from cattle; (2) The final proof that eczema marginatum of the groin is really a ringworm, and the discovery that many so-called eczemas of the hands and feet are also ringworms; (3) The demonstration of the animal origin of certain forms of favus; and above all (4) The discovery of the new disease sporotrichosis, formerly mistaken for syphilis or tubercle, but due to a deep invasion by a mould fungus.

Of the body ringworms, a convenient but rough clinical classification is proposed as follows in three groups: (1) Red scaly patches or rings, generally associated with the ordinary ringworm of the scalp; (2) Somewhat more inflammatory ringworms due to infection from the

PLATE XLIII.

RHINOPLASTY—HOLLANDER'S METHOD

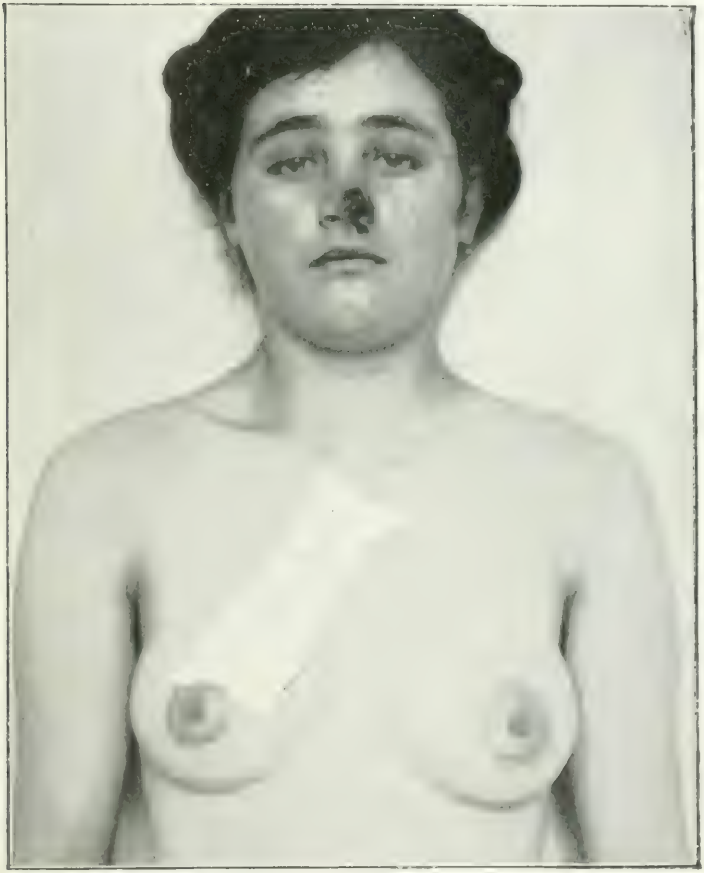
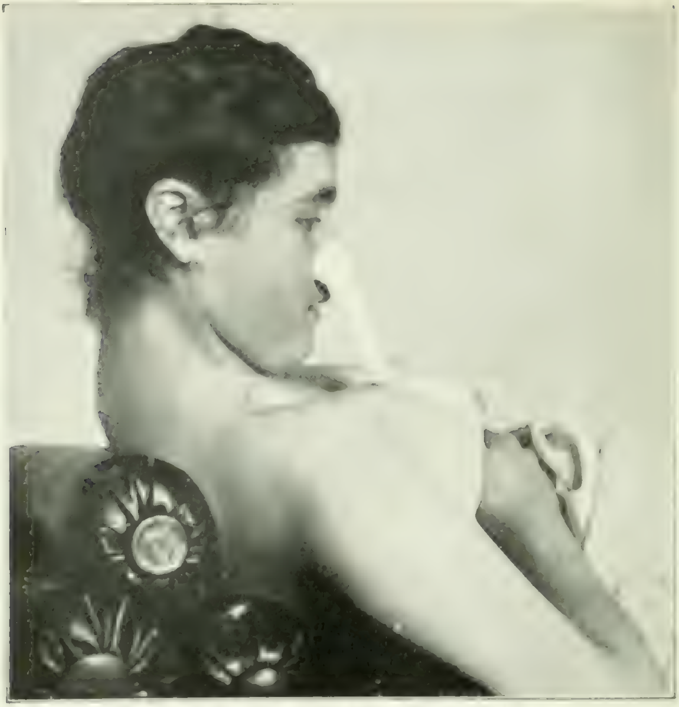


Fig. A.—Showing position of skin flap.

PLATE XLIV.

RHINOPLASTY—HOLLANDER'S METHOD *continued*



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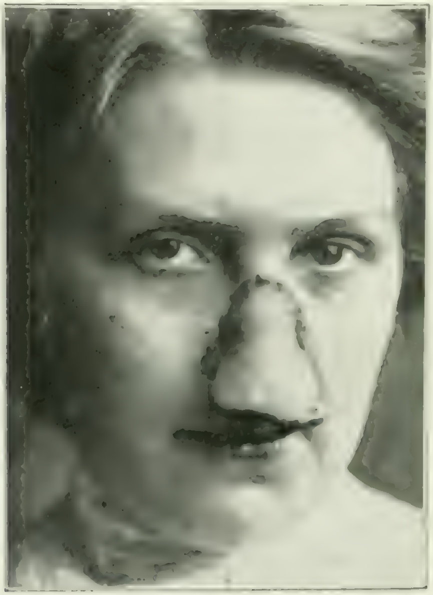

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cat. (3) Highly inflammatory ringworms derived from horses and cattle.

The cat ringworms are probably comparatively common, and they not infrequently affect the beard as well as the smooth skin. A noteworthy feature of ringworms of animal origin is that they tend to spontaneous cure, and that a patient once affected is protected against a subsequent attack.

Eczema marginatum was proved by Sabouraud to be caused by an organism which, as it does not infect the hair, cannot properly be called a trichophyton, which, however, it very closely resembles, and accordingly the name "*epidermophyton inguinale*" was given to the organism which most frequently infects the groin region in male patients. It is much less common in females, and when occurring in them is generally derived from sexual contact with males. Associated with this form is a weeping eczematoid condition of the fingers and toes, also due to the fungus, which can be isolated from these parts as well. Its recognition is of great practical importance, as if mistaken for eczema, which usually happens, the treatment will probably be futile to eradicate ringworm, and cases of extreme chronicity may result. The writer has seen such a case in which the disease had been probably present in a medical man for fifteen years, and was cured in a few weeks when its nature was elucidated. All cases of ringworm of the hands and feet are not, however, to be taken as necessarily due to the *epidermophyton inguinale*. One of the most notable of the plantar infections is with the animal ringworm identified by Djelaleddin-Mouktar, which causes a thickening and exfoliation of the skin of the toes and ball of the foot.

A new variety of favus, *achorion violaceum*, has been added to the four varieties previously recorded. Favus is very rarely contracted from animals, and then almost exclusively from the mouse, in which it is not very uncommon. The eruption as it appears on the glabrous skin may be very like that of ringworm when scutula are not present. The treatment is the same as for ringworm.

TREATMENT.—The *treatment* for ringworms of the smooth skin consists in the destruction of the fungus. This may be effected by application of **Iodine, Chrysarobin,** or the following ointment, which is the most pleasant to use :—

℞ Acid. Salicyl. | Adipis Benzoat. ℥j
Acid. Benzoic. āā gr. xv |

Agnes Savill[2] experimenting with the lotion of **Picric Acid** and **Camphor** :—

℞ Acid. Picric. gr. vij | Spt. Vini Rect. ℥ss
Camphor ʒss |

recommended by Winkelried Williams in the treatment of *ringworm of the scalp*, gives the following instructions to be observed in the application :—

"Directions are given that the hair should be cut round the diseased patch in the usual way, and the lotion painted on with an ordinary camel-hair brush morning and evening. As the lotion evaporates, a yellow powder accumulates on the head. This powder must be washed away lightly at least twice a week, so as to ensure that the fresh application reaches the scalp. It is important that the hair should be cut short by clipping or shaving two or three times a week, otherwise the lotion will not penetrate to the scalp but accumulates on the hairs. If all these details are carefully observed, the hair becomes loosened in about three or four weeks, and can readily be pulled out by epilation forceps. Epilation must be performed carefully with the forceps applied as closely to the root of the hair as possible; otherwise the hair is broken off above the scalp, and the disease remains in the follicle. In order to make sure of the degree of progress of the disease and of its absence at the end of the treatment, the useful and rapid method of rubbing over the patches with chloroform may be used; as it evaporates, the grey frosted appearance of the diseased hairs cannot be mistaken or overlooked. When epilation has been performed roughly, the tiny stumps of the broken shaft are instantly revealed."[1]

Garrett[2] recommends **Liq. Ferri Perchlor. Fort.** as a local application in the treatment of ringworm of the scalp. The head must be freed from grease—by rinsing in motor petrol for example—and washed in water. The perchloride solution is painted on the scalp with a camel-hair brush every two days for three applications, then every three days for six applications. The hair need not be cut, and the child can attend school during the treatment.

Nock[4] has seen good results with an "old wife's" method described as follows. A piece of **Sodium Hydrate** ("household" washing soda) of the size of a walnut is held against a red-hot poker until the salt melts, and the melted end is then rubbed freely into the ringworm. One such application is said to be sufficient for ringworm on the smooth skin; it may be repeated a week later for ringworm of the scalp. The method is said to be painless and to leave no scar.

REFERENCES.—[1]*Brit. Med. Jour.* Aug. 9th, 1913; [2]*Pract.* 1913, ii, 41; [3]*Brit. Med. Jour.* 1913, i, 900; [4]*Ibid.* 398.

RUBELLA.

E. W. Goodall, M.D.

According to Gerhard Schwaer,[1] the disappearance of the eosinophiles at the height of the disease is typical of measles only, and not of rubella; and a leucopenia during the eruptive stage cannot be looked upon as the rule in rubella.

REFERENCE.—[1]*Münch. med. Woch.* 1913, 1217.

SALPINGITIS.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

Stone[1] treats cases of salpingitis by the conservative method, i.e., by injection of solution of **Iodine** (one part in three of alcohol) through the dilated cervix uteri and uterine ostia of the tube under pressure. He has very good results and mentions one patient with gonococcal salpingitis treated in this way who afterwards had two children.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1913, i, 931.

SAND-FLY FEVER.

Leonard Rogers, M.D., F.R.C.P.

F. C. Taylor and M. H. Kalan[1] discuss the clinical differentiation of sand-fly or three-day fever on the Punjab frontier from malaria. The former begins in June and lasts to September; while malaria is prevalent during August and September. Sand-fly fever is a better term than three-day fever, because in 101 cases the fever only lasted one day in 45 per cent, two days in 34·4 per cent, and three or four days in but 20·6 per cent. The most constant and characteristic signs are that the patients come to hospital complaining of pains in the body and limbs (worst in the loins), catarrh of the conjunctivæ and fauces, with redness of the soft palate, and slow pulse rarely exceeding 100, with a temperature of 102°, which is never the case in malaria, from which the disease can be readily distinguished by paying attention to these points. The blood was examined for malarial parasites in all the cases, with negative results, except in one case of apparently mixed infection.

C. Birt[2] reviews the literature of sand-fly or phlebotomus fever and dengue, and notes that the latter occurs as explosive epidemics swiftly spreading through a community until all the susceptible have been attacked. It may occur at the same time as the regular seasonal sand-fly-fever, and one does not produce immunity to the other, proving them to be distinct. Experiments show that the blood of sand-fly fever patients is only infective during the first twenty-four hours, while that of dengue can be transmitted through the blood at a much later period. Sand-flies fed on fever cases only become infective after six days, while the *Stegomyia* mosquito can transmit dengue directly after feeding on the blood of a dengue patient.

REFERENCES.—[1]*Ind. Med. Gaz.* 1912, 475; [2]*Jour. Trop. Med.* 1913, 169, and *Trans. Soc. Trop. Med.* 1913.

SCARLET FEVER.

E. W. Goodall, M.D.

ETIOLOGY.—Since Grünbaum, in 1904, published the results of certain attempts he had made to transmit the infection of scarlet fever to chimpanzees, a number of similar experiments have been carried out by several observers (Cantacuzène, Bernhardt, Kraus and Landsteiner, Levaditi, Prasek, and Danulesco) on monkeys and anthropoid apes. An excellent summary of these observations has been published by Levaditi.[1] It appears to be very difficult, if not impossible, to infect monkeys, but a certain amount of success has attended the experiments on anthropoids. The method employed was to smear the fauces with exudate taken from a case of scarlet fever, and at the same time, or very shortly after, to inject subcutaneously 10 c.c. of blood from the patient. After an incubation period of three to six days the animal has become ill with fever, inflammation of the fauces, and a reddish, somewhat indefinite exanthem. These symptoms occurred in five chimpanzees and one orang outang treated by Landsteiner and his fellow workers; but the rash was not present in three of the chimpanzees. The two cases with rash were fatal after several days' illness. Only in the case of the orang outang did desquamation follow, and microscopical examination of sections of the skin of both chimpanzee and orang outang showed appearances just like those seen in the human subject according to all the authorities. But though this evidence goes to show that scarlet fever can be experimentally given to the animals mentioned, the actual cause of the disease remains undiscovered.

PATHOLOGY.—In November, 1911, Dohle[2] of Kiel first described certain bodies found in the polymorphonuclear leucocytes in scarlet fever which, he stated, were of value in the diagnosis of that disease because they were very seldom found in any other. These bodies, which are known as "inclusion bodies," are round, oval, or curved bodies, varying in size from a coccus to a large bacillus. They are distinct from the nucleus of the leucocyte and are usually situated towards its periphery. Since Dohle described these bodies, several observers have paid attention to them, and, unfortunately—for it would be of immense help in the diagnosis of scarlet fever if a pathognomonic sign were discovered—they have not confirmed his statement as to the limitation of the bodies to scarlet fever. One of the latest papers on the subject is that by Granger and Pole,[3] who, after examining the blood of a number of cases, not only of scarlet fever but of other diseases and of normal persons, are forced to conclude that "the presence or absence of the bodies is of no use in making a differential diagnosis;" and further, that "the bodies are found in most diseases caused by ordinary pyogenic organisms, especially if streptococci are present." They state, however, that the absence of the bodies practically excludes scarlet fever.

SYMPTOMS.—J. D. Rolleston,[4] from a study of the *blood-pressure* in 122 cases of scarlet fever, using C. J. Martin's modification of Riva-Rocci's sphygmomanometer, found it subnormal in 23 per cent, the extent and duration of the depression being as a rule in direct relation to the severity of the initial attack. In the great majority the highest readings were found in the first week; there was also a predominance of the lowest readings in the same week, but in a large minority the lowest readings were found in the second week. The normal tension was usually re-established by the fourth week. In a majority the blood-pressure was lower in convalescence than in the acute stage. In 58·4 per cent of the convalescent cases the readings in the recumbent and erect positions were the same, or the recumbent was higher than the vertical record until convalescence was firmly established (hypotension of effort). With the exception of nephritis, complications had little, if any, effect upon the blood-pressure. In only a minority of the nephritic cases—12 out of 41—was the blood-pressure above normal, and the hypertension was never extreme or of long duration. Sphygmomanometry in scarlet fever, as in most of the other acute diseases, is of little practical importance in the acute stage, but in convalescence may give some indication of the severity of the renal lesion which may be of value in subsequent treatment of the patient. Pronounced arterial hypotension, if accompanied by other signs of acute suprarenal insufficiency, should be treated by **Suprarenal Extract.**

J. Biernacki and A. L. Dykes[5] have published a case of rapidly fatal *purpura* following scarlet fever. The patient was a boy, aged six years, and the purpuric symptoms appeared during convalescence, nearly eight weeks after the attack. The child died in three days. J. D. Rolleston,[6] commenting upon this case, points out that it is probably one of the class to which Henoch gave the name of "purpura fulminans." It differed from this form in not presenting symptoms of hæmorrhage from the mucous membranes; but there was no autopsy. Of 65 cases of purpura fulminans now on record, 18 have followed an attack of scarlet fever.

REFERENCES.—[1]*Presse Méd.* 1912, 701; [2]*Centralbl. f. Bakt.* 1911, lxi, 63, and 1912, lxv, 57; [3]*Brit. Jour. Child. Dis.* 1913, 9; [4]*Ibid.* 1912, 444; [5]*Brit. Med. Jour.* 1913, ii, 903; [6]*Ibid.* 1302.

SCIATICA.

Purves Stewart, M.D., F.R.C.P.

Every practitioner knows from his own experience that whilst a certain proportion of sciatica cases react promptly to simple remedies, such as rest, local hot applications, etc., yet again there are others which are particularly resistant. In these obstinate cases, treatment by **Injections**, whether into the nerve trunk itself, or into the perineural tissues, seems to afford the greatest measure of success. Readers of the MEDICAL ANNUAL (1910) are already familiar with Lange's treatment of sciatica by large deep injections of normal saline solution containing 0·1 per cent of β-eucaine. Other solutions have been recommended, such as those containing antipyrin, stovaine, morphine, cocaine, etc., but it seems probable that the site of injection is more important than the composition of the fluid.

Langbein[1] selects the lower end of the sacral canal for injections in sciatica, following the technique of epidural injections originally suggested some years ago by Cathelin in cases of frequency of micturition without evident anatomical cause. Läwen[2] appears to have been the first to select this mode of local anæsthesia for the treatment of sciatica. It will be remembered that the spinal theca terminates at the second sacral vertebra. Below that level the nerve-roots in the sacral canal are enclosed in loose areolar tissue, and can be reached by epidural injection. An alkaline 2 per cent solution of novocain is made by boiling down the following solution to half its volume: Sodium bicarbonate 0·25 gram, sodium chloride 0·5 gram, novocain 1 gram, in 100 c.c. of sterilized distilled water.

[illegible] the needle during the performance of epidural [illegible]

The technique of injection is as follows: A lumbar-puncture needle is used, with a glass syringe containing 20 c.c. of the solution. The patient sits with the trunk strongly bent forward, and with the buttocks projecting backwards slightly over the edge of the operating-table (*Fig.* 54). The position of the sacro-coccygeal membrane, or fontanelle, which closes the lower end of the sacral canal is then identified. Its shape is that of an inverted U or V. The projection formed by the elementary laminæ or cornua of the fifth sacral vertebra is first felt for. Between these two cornua is the membrane, which feels elastic and yields slightly to firm pressure. In very fat patients it may be impossible to find the fontanelle. Läwen and Langbein exclude such cases at the outset. The needle is pushed perpendicularly through the membrane until it impinges on the anterior bony wall of the sacral canal. The point of the needle is then slightly withdrawn and its direction changed till it runs upwards along the canal, pushing up for a distance of 4 to 5 cm. The fluid is then injected very slowly, about five minutes being taken to empty the syringe. In a successful case the needle cannot be felt under the skin, the injection goes easily and without resistance, no subcutaneous œdema is produced, and the patient usually has a feeling of tingling or pressure in both legs. After the injection, the patient remains with the trunk propped up and the legs dependent. Any slight feeling of faintness can be checked by a temporary horizontal posture. In from fifteen to twenty minutes all symptoms of sciatica disappear. It is advisable to keep the patient in bed for a couple of days afterwards.

Out of 12 patients (11 men and 1 woman) thus treated by Langbein 7 were cured and remained free from recurrences, 4 were improved, and 1 (a case in which the diagnosis was uncertain) was unchanged.

It is not claimed that this treatment should be adopted as a routine method in all cases of sciatica. A careful diagnosis must first be made; arthritic and intra-pelvic and other local causes must be carefully excluded, and even then Langbein advises that, before resorting to epidural injections, the patient should have a fortnight's energetic treatment with **Hot Applications** and **Antineuralgic Drugs**. The method is specially suitable to cases of root pains where the distribution extends higher up the buttock than in ordinary sciatica. The technique is admittedly somewhat more difficult than that of injection into the sciatic nerve trunk.

REFERENCES.—[illegible]

SCLEROTICS, BLUE.

Frederick Langmead, M.D., F.R.C.P.

The first mention of this curious hereditary anomaly appears to have been made by Ammon in 1841, but it is only in the last ten years or so that it has attracted attention. E. A. Cockayne[1] gives an account of six members of an interesting family in which blue sclerotics occurred for five generations and were associated with osteoporosis. The colour varies in intensity from a light azure to a very deep blue, and is present in the whole of the visible sclera. In Cockayne's case it was uniform, but in those described by Peters and Bishop Harman it was more intense in the ciliary zone.

Most writers on the subject hold that this appearance is due to abnormally thin sclera, the pigment in the eye being seen through them, but no histological examination has yet been made. Conlon points out that if this were the true explanation, the condition would be associated with buphthalmia and with myopia, but in the eighty recorded examples which he has collected, neither of those defects is mentioned. He thinks that the sclera are more translucent, but of normal thickness. Embryontoxon, an anomaly due to extension of the upper layers of the sclera into the cornea, has frequently been seen in association with blue sclerotics, and was found in each of Conlon's cases. The hereditary transmission is direct, and never to males through unaffected females, and the blueness would appear to be "dominant."

Osteoporosis was first noticed in these cases by Eddowes, who described two examples in father and son. In 13 cases collected by Burrows, 9 had suffered from brittle bones, and of 9 recorded by Adair Dighton 5 gave a similar history. In all the families reported as having blue sclerotics, the tendency to fractures from trifling causes is more or less marked, except in one (that reported by Sidney Stephenson), and in this one there is no evidence to the contrary. Radiograms show more particularly thinness of the shafts of all the long bones as compared with the size of the epiphyses.

REFERENCE.—[1]*Bost. Med. and Surg. Jour.* 1913, ii, 16.

SEBACEOUS HYPERSECRETION. *E. Graham Little, M.D., F.R.C.P.*

Kuznitzky,[1] in the course of some experiments, claims to have established the important therapeutic conclusion that **Bromides** diminish sebaceous secretion. By taking daily doses of 4 to 5 grams of bromide, he diminished his own secretion of sebum by nearly one half. The method used was to weigh woollen clothes (from which fat had been previously extracted) before and after wearing. As, however, the daily excretion of sebum estimated by various observers varies from 40·8 grams (Krukenberg) to from 1 to 2 grams (Kuznitzky), the methods of estimation cannot be regarded as above suspicion.

REFERENCE.—[1]*Arch. f. Derm. u. Syph.* 1913, Feb. (*Brit. Jour. Derm.* xxv, 246).

SEMINAL VESICLES, DISEASES OF. (*See also* PROSTATE.)

J. W. Thomson Walker, M.B., F.R.C.S.

C. S. Lawes and J. W. Sherman[1] record a case of *seminal calculi* simulating nephrolithiasis, and review the literature of the subject. These calculi are generally admitted to be very rare. Fuller, in an experience of 240 vesiculotomies, only met with two examples. They may give rise to spermatic colic occurring at the time of ejaculation. The pain, McHugh states, is felt at the neck of the bladder, radiates upwards or down to the testicles, is sharp, and may produce nausea. As a result of obstruction the emission may be deficient or fail altogether.

in which case the colic may last for a few minutes. The calculi, according to Cooper, give rise not infrequently to pain on micturition and defecation, which Tuholske describes as referred to the perineum, groin, lower rectum, and lumbar region. Calculi in the seminal vesicles may present the clinical picture of renal calculus, which may be explained by reflex impulses through the abundant nerve supply.

Robert H. Herbst[2] discusses the surgical treatment of *chronic seminal vesiculitis* by **Vasostomy** (Belfield operation). The following classification should be made: (1) Cases of chronic seminal vesiculitis in which the ejaculating ducts are patent; (2) Cases in which they are atresial or partially occluded; (3) Cases with complete obstruction of the ducts; (4) Cases complicated by stricture of the vas deferens high up. The cases in the first class are recognized by the ease with which the vesicles can be emptied by pressure of the finger in the rectum. Most of these cases respond to stripping and instillation, and do not require any operative interference. The cases in the second and third classes have a partial or complete occlusion of the ducts, and the only hope for cure lies in some operative measure, such as vasostomy, incision or excision of the affected organ. The author has abandoned stripping the vesicles in all cases in which they do not readily empty on pressure from the rectum. Vasostomy is a valuable measure in the prevention of recurring attacks of acute epididymitis. Cases in the fourth class are rare.

The purpose and results of **Seminal Vesiculotomy** are discussed by Eugene Fuller.[3] It is a prevalent but erroneous supposition that incision into the seminal vesicle destroys it. The author classifies his cases of seminal vesiculotomy according to the following groups of predominant symptoms: (1) Urinary; (2) Genital; (3) Nervous and mental; (4) Rheumatic. In the urinary group are most of the acute virulent cases, in which the gonorrhœal process quickly extends into the surrounding tissues, "much peri-prostatic general tumefaction resulting." There is difficult micturition, and often complete retention. The old way of treating these cases by perineal cystotomy was unsatisfactory. Seminal vesiculotomy gives prompt relief, voluntary and free urination being usually re-established within twenty-four hours. In the second group the symptoms of sexual impairment predominate, impotency or marked weakness being the usual feature. The third group, in which nervous and mental symptoms predominate, is small, as these individuals are disinclined to submit to operation. The mental symptoms complained of comprise confusion of ideas and deficient concentration, especially after sexual disturbances or effort. Mental depression, even melancholia, is common. Marked loss of initiation, trepidation, and a high degree of timidity are not infrequently manifest. The rheumatic group are all crippled to some extent, and many of them are bedridden. Tuberculous joints, arthritis deformans, gout, chronic inflammatory rheumatism, progressive muscular atrophy, and myelitis, are among the diagnoses previously made in cases cured by seminal vesiculotomy. This operation taps the septic focus; the systemic toxæmia ceases, and the crippling lesions resolve. In some instances, after the toxæmia has disappeared, massage, passive movements, and other agencies are to be recommended. It is better, however, to wait for two or three months after the operation before commencing these manipulations. Fuller has performed the operation of vesiculotomy in 254 cases without any mortality. "Of 89 rheumatic patients, there was not one who was not radically relieved and satisfied with the operation result. Eighty per cent of the patients were well and free from all symptoms when they passed from observation a month or six weeks after the operation."

References.—[1]*Surg. Gyn. and Obst.* 1913, i, 302; [2]*Jour. Amer. Med. Assoc.* 1912, ii, 2242; [3]*Ibid.* 1959.

SEPTICÆMIA. *Herbert French, M.D., F.R.C.P.*

Fatal septicæmia due to an organism of the *B. proteus* group, generally regarded as saprophytic rather than pathogenic, is recorded by Braxton Hicks.[1] The patient, a widow, aged 58, had had an offensive vaginal discharge for months, and then developed septicæmic symptoms, suppurating clot being found post mortem in the iliac veins and inferior vena cava. The same organism was recovered from the blood on two separate occasions, and its full cultural characteristics are given in the original paper. It proved pathogenic for guinea pigs. Although belonging to the proteus group, it differs in certain respects from *B. proteus vulgaris*, and appears to be a species not hitherto described. It is of some interest in this connection that Bryant long ago recovered organisms of the proteus group from a series of successive fatal cases in which ante-mortem thrombosis had occurred in some one or other of the larger veins.

A very severe case of generalized infection with *B. pyocyaneus*, ending fatally, is recorded in detail by Michell Clarke,[2] in which, besides serious cerebrospinal symptoms, there was intense jaundice, and the lungs post mortem were riddled with small abscesses. The *B. pyocyaneus* was recovered in pure culture from the blood and fæces during life, and from the heart's blood, pleural exudate, and lung abscesses after death. The author comments on the peculiar cadaveric odour exhaled from the patient when alive, and also upon a relative increase of the large mononuclear cells in the blood, without great leucocytosis; the latter may be of diagnostic value in future cases, though blood-culture alone serves to clinch the diagnosis.

There is increasing evidence to show that *Micrococcus tetragenus* may itself cause serious illness in human beings, and that it is not always merely a saprophytic or associated organism. A case in point is recorded by Byers and Houston.[3] The clinical features were very much those that may be associated with galloping consumption, and it was feared that this was the nature of the illness. No tubercle bacilli could be discovered in the sputum, however, and eventually the patient got better under **Vaccine** treatment. The evidence in favour of *Micrococcus tetragenus* being really the infecting organism responsible for his condition was the presence of this micro-organism in pure culture in the blood, its presence in the throat, ear discharge, sputum, and urine, an opsonic index varying with the temperature to this organism (1·7 and 2·1), and the effect of the administration of a vaccine made from it. The following temperature chart shows the course of the latter part of the patient's illness when the vaccines were being given:—

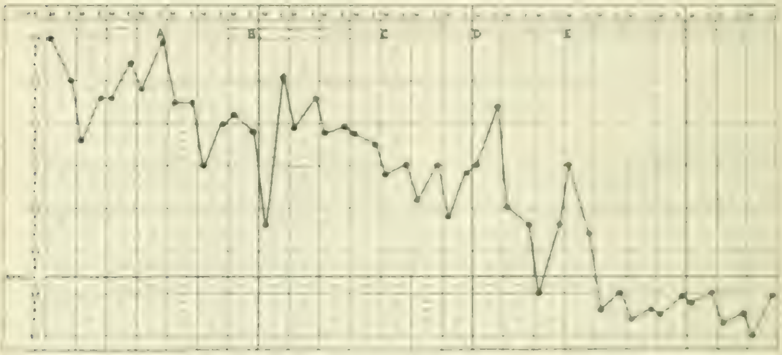


Fig. [illegible].—Chart of a case of [illegible] vaccine treatment.—At A, [illegible] million; at B, 4 million; at C, 15 million; at D, [illegible] million; at E, [illegible] million.

References.—¹*Lancet*, 1913, i, 1126; ²*Brit. Med. Jour.* 1913, i, [illegible]; ³*Lancet*, 1913, i, 1723.

SEVEN-DAY FEVER. *Leonard Rogers, M.D., F.R.C.P.*

W. E. Deeks¹ describes an outbreak of a short fever in the Panama Canal zone which was quite new to observers there. It commenced among postal sorters of the foreign mails, and spread first in houses occupied by post-office workers. It was at first thought to be malaria, but repeated negative blood examinations and the negative effect of quinine excluded that disease. Deeks describes it as a six-day fever without a break, while his charts show a terminal rise. It began suddenly, the pulse generally ranged from 98 to 120, the blood picture was unchanged, and a trace of albumin was often found. The incubation period appeared to be about ten days. Pains in the back and about the eyeballs was noted, but no break-bone pain. A slight erythematous rash was present in some cases. The spleen was sometimes enlarged. It was distinguished from dengue by being a single-phase fever. Widal tests and blood-cultures were negative. It is thought by Deeks to be identical with seven-day fever described by Rogers and Crombie in Indian seaports. The few cases in which Rogers found *B. coli* groups of organisms may have been paratyphoid. No drugs had any effect on the fever, and the mortality was nil.

Reference.—¹*Jour. Trop. Med. Hyg.* 1913, ii, 291.

SINUS THROMBOSIS. (See Otitis Media.)

SKIN, EPITHELIOMA OF. [*See also* Arsenical Cancer.]

E. Graham Little, M.D., F.R.C.P.

Williams and Ellsworth[1] summarize their results in the treatment of cutaneous epitheliomata with **Radium.** They regard it as especially useful in epitheliomata near the eye, and as being preferable even in early cancers in which operation is usually recommended. The number of applications average from three to ten; if improvement is not obvious after three, the nature of the growth may be questioned. If the patient is of low vitality, the success may be delayed. For keloids of moderate extent, radium is the best means of treatment.

The use of **Ethyl Chloride** as a freezing agent in the treatment of superficial cutaneous epithelioma is recommended by Seidelin,[2] who keeps the tissues frozen for from two to five minutes. There was very little pain and very slight visible reaction, and no subsequent dressing beyond the usual aseptic covering is needed. [*See also* Skin, General Therapeutics of.]

Fabry[3] recommends the combined use of **Carbon Dioxide Snow** and **X-rays** in superficial epitheliomata of the type of rodent ulcer. The lesion is subjected to two applications for one minute of carbon dioxide in stick form, with a short interval between the applications to allow of thawing, and on the same or following day a full pastille dose of x-rays is given to the lesion, to be repeated if necessary.

References.—[1] *Jour. Amer. Med. Assoc.* 1913, i, 1694; [2] *Lancet*, 1913, i, 1663; [3] *Arch. f. Derm. u. Syph.* 1913, Apr. (*Brit. Jour. Derm.* xxv 292).

SKIN, GENERAL THERAPEUTICS OF.

E. Graham Little, M.D., F.R.C.P.

The properties of **Resorcin** are described by McMurtry.[1] Upon exposure to light and air it turns yellowish brown; solutions should therefore be kept in dark well-stoppered bottles. It is very soluble in water, alcohol, ether, and glycerin; less soluble in the fixed oils. It is incompatible with alkalies, menthol, iodine, corrosive sublimate, permanganate of potash, and the mineral acids. Resorcin may stain the hair a yellow colour, and the skin brown, effects which can be removed by citric acid or lemon juice.

In dilutions of ½ to 1 per cent it arrests bacterial growth; in dilutions of 2 per cent and over it is a parasiticide. It is a valuable antipruritic in aqueous or alcoholic solutions of ½ to 3 per cent; in *pruritus ani* the author effected a cure with the application of a 5 per cent alcoholic solution repeated hourly until pruritus had ceased, and then continued thrice daily. In ointments, 5 per cent should be the maximal strength unless the exfoliative action is desired. In solutions of 1 to 3 per cent it exerts a desiccant and keratoplastic effect. It has also a strong keratolytic effect in ointments of 10 to 50 per cent, and especially in the form of plasters. It is the basis of Unna's exfoliating treatment in *acne* and *rosacea*. "A paste consisting of

℞ Resorcini
Pasta Zinci (Unna) āā part. x
Ichthyolis part. j

is rubbed into the face morning and evening after washing with green soap and hot water. In three to four days the skin assumes a dry, stiff, tense appearance, like a mask. At this point the paste is discontinued, and Unna's zinc varnish (gelatin. alba 30, zinci oxydati 30, glycerin. 50, aquæ 90; M. F. gelat.) is applied for twenty-four hours, after which it is removed with warm water, and the horny layer easily taken off with the fingers or forceps, exposing a rosy and tender, but well-formed skin beneath. This method gives highly satisfactory results in seborrhœa of the face, acne vulgaris, and rosacea."

A somewhat similar method of exfoliation is described by Darier, and "consists in applying for three successive nights a bandage covering the entire face in the form of a mask (with the usual orifices) with the following:

℞ Tr. Sap. Virid. 20 per cent. part. xl | Sulphur. Præcip. part. x
Resorcini part. x

This is allowed to dry on the face, and on the following morning a soothing lotion or cold cream is applied. There is some pain, but for a few hours on the first night only. The procedure is repeated each night until desquamation occurs. This usually begins on the fourth day, and is complete about four days later."

Resorcin is seldom now used internally, as it has toxic effects which may be produced even by external use. It should always be used with caution, and avoided for extensive areas. Dermatitis may result in the less severe intoxications; in the serious cases, convulsions, delirium, and even death may occur. Idiosyncrasy to the drug is not rare. A case of unusual sensitiveness to resorcin is reported by Montgomery.[2] The patient, an adult male, developed a very severe reaction with a paste containing 2·25 per cent of resorcin; the same effect was noted with a dilution to half this strength. The sister of this patient did not show the same idiosyncrasy.

M. Murry[3] contributes a very full note on the properties of **Salicylic Acid.** Alcohol and ether are the best solvents. It is incompatible with, amongst others, diachylon plaster, and with silver nitrate. Its use is contraindicated in the treatment of cutaneous surfaces deprived of their epidermis and in epitheliomata. Its action is chiefly keratolytic, producing exfoliation, and it appears to have a certain selective affinity for pathological tissue. In dilutions of ·25 per cent it prevents the development of bacteria, and is consequently much used in hyperidrosis, to prevent unpleasant smell from sweat; in dilutions of 3 to 4 per cent it is a powerful *parasiticide*. Ointments containing 10 to 15 per cent kill pediculi and nits. The acid has a stimulating effect on epithelial growth when the strength does not exceed 3 per cent. Beyond this proportion it exerts a solvent action on epidermis, which is found in its highest degree in the form of plaster and in its lowest in the solutions in alcohol and ether. The addition of zinc oxide decreases the keratolytic effect. Salicylated oils containing 3 to 5 per cent of the acid, are suitable for hairy surfaces where pastes would be inconvenient. In using both pastes and oils, the anointed parts should be covered with oil-silk.

McMurtry[1] analyzes the properties of **Sulphur** as follows. The precipitated form is so much superior to others that this alone is considered. Sulphur is only soluble 1–1000 in water, but readily soluble in a number of fluids, including ether, alcohol, glycerin, and the fixed oils. It is soluble in hot aqueous solution of the hydrates of potassium, sodium, barium, calcium, forming polysulphides and thiosulphates. It is incompatible with a very large number of substances, including all metallic salts and metals; with nitric, picric, chromic, and hydrochloric acids; with hydrogen peroxide.

Externally, the action is keratoplastic and vasoconstrictor in dilutions of 4 to 10 per cent, an action which is increased by addition of alkalies and soap. A moderate keratolytic action may also be produced by sulphur as in the exfoliating paste recommended by Lassar, which consists of

℞ β-Naphthol part. x | Vaselini
Sulph. Præcip. part. l | Sapon. Nigr. āā part. xxv

This is applied to the face and removed at the end of thirty minutes with a wet cloth. A dermatitis results after several applications, and the horny layer peels off as with a strong resorcin paste.

As a *parasiticide* sulphur acts probably by reason of the generation of sulphuretted hydrogen. It is still the most valuable agent in the treatment of scabies (10 per cent ointments). When used in this form of ointment, dermatitis not infrequently results, and sulphur in the form of powder may be preferred. The powder is rubbed into the skin and the undersheet copiously dusted with it. Cure usually follows in nine to ten days. As this method requires no baths, and does not involve greasing of the clothes, it offers advantages besides that of avoiding dermatitis. Sulphur also protects against bed parasites—fleas, bugs, and lice,—and may be used in the form of the following powder dusted over the body or on the sheet:—

℞ Sulph. Præcip. | Talci Pulv. gr. xx
Camphor. Pulv. āā gr. xl |
Ft. pulv.

Powdered sulphur may also be used in 5 per cent strength for *hyperidrosis*. In the form of lotion sulphur is very useful, though less active than in ointments. A convenient form, especially in facial acne, is:—

℞ Zinc. Sulph. | Glycerin part. x
Pot. Sulph. āā part. xij | Aq. dest. ad part. cc
To be well shaken before use.

Or this:—

℞ Sulph. Præcip. | Aq. dest. part. cl
Glycerini āā part. x | Amyli q.s. ut. fiat emuls.

In pityriasis simplex of the scalp G. T. Jackson's[1] sulphur cream is highly recommended :—

R Ceræ Alb.	ʒiiss	Sod. Bibor.	gr. xv
Ol. Petrol.	℥iss	Sulph. Præcip.	ʒiiss
Aq. Rosæ	℥i		

To be rubbed into the scalp twice a week.

For acne rosacea, and seborrhœic dermatitis 15 to 25 per cent strengths may be used. The following is a formula of the author's :—

R Resorcini		Acid. Salicyl.	part. v
Sulph.		Lanolini	
Camph.	āā part. x	Vasilini	āā ad part. c

Apply night and morning, with massage, after washing the face with soft soap and hot water.

For pigmented areas, chloasma, etc., the following paste is suggested :—

R Sulph. Præcip.	part. xx	Acid. Acetic.	q.s. ut. ft. pasta mollis.

Sulphur soaps are largely inert unless the lather is rubbed into the skin and left on from ten to twenty-four hours.

Sulphur should never be used in acute inflammations, or on surfaces denuded of epithelium, or in persons with eczematous tendency. When applied over large areas toxic symptoms may result ; and there is often an idiosyncrasy to the drug which must be kept in mind.

The action of sulphur is also discussed by Foerster,[2] who reviews the literature fully. Two views have been held as to the manner in which sulphur acts. One propounded by Unna ascribes its activity to the production of sulphuretted hydrogen in contact with the skin ; the other by Bisson, who regards the formation of sulphurous acid as the explanation. Foerster supports Unna's view, and remarks on the clinical experience of various sulphur preparations ; the most active of these, Vleminckx's solution or liquor calcis sulphurata made by boiling lime and sulphur together, probably owes its efficacy to the production of hydrogen sulphide and nascent finely divided sulphur which is deposited on the skin.

Under the heading of *the treatment of moist dermatoses*, C. J. White[3] describes a method of dressing with **Borated Talc** which he personally recommends, especially in extensively exudative disease. The patient is kept in bed throughout, an air mattress being a useful adjuvant. Diet consists of "soft solids," with abundance of water ; no baths are allowed. Borated talc powder is applied with a sifter very freely, the patient lying naked in bed, the coverings being supported by a frame. The floor and walls of the room are bare, and all superfluous furniture is removed. As there is much dust when the treatment is efficiently carried out, the aural, nasal, and mouth orifices may be protected. The limbs should be separated so that no portion of skin rubs one upon the other. If there is much suppuration, a preliminary treatment with **Black Wash** is recommended, and this must be repeated if collections of pus occur. Combined with the local measures which are regarded as the most important, large doses of **Quinine** were used in some of the cases with apparent benefit. The diseases in which the "dry" method was tried were chiefly *exfoliative dermatitis* and *pemphigus*, and the results compared very favourably with another series of cases treated by miscellaneous methods.

Ichthyol. McMurtry[7] points out that the chemical constitution of ichthyol is not exactly known, but it is probably a sulphoichthyolate of ammonium. Its content of sulphur, on which its therapeutic value is largely dependent, would appear to be variable. Ichthyol is entirely soluble in water, and in equal parts of alcohol and ether. It mixes freely with glycerin, oils, and fats. It is incompatible with, among other substances, acids, alkalies, alkaloids, mercuric chloride, and resorcin. Its most valuable therapeutic effects in external use are those of an antiseptic, antiphlogistic, antipruritic, and vasoconstrictor; used internally, it acts as an intestinal antiseptic and astringent, and is much used in cutaneous hyperæmia. It may be given with equal parts of peppermint water in doses of 3 to 5 drops three times daily on an empty stomach, and the amount taken may be increased to 60 drops a day.

It is one of the best local remedies in *erysipelas*, and may be used pure, or in ointments containing 20 to 30 per cent. Combined with iodine (1 to 3 per cent dissolved in alcohol and ether; *not* the tincture, the potass. iodide of which is incompatible with ichthyol) it has a greatly increased antiseptic effect. In *frostbite* and *burns* it is especially indicated, in the form of ointments or lotions, from 10 to 50 per cent in strength. For burns of the first degree, a powder may be recommended:—

℞	Zinc. Oxidi	part. xx	Ichthyol.	part. iij
	Magnesii Carb.	part. x		

Or this paste for burns of the second degree:—

℞	Calcii Carbonat.	part. x	Zinc. Oleat.	part. x
	Zinc. Oxidi	part. v	Ichthyol.	part. iij
	Amyli	part. x	Aq. Calc.	part. x

In *eczema* and *acne vulgaris*, ichthyol is used in ointments or lotions of 2 to 50 per cent strength, or it may be applied pure to the skin in very indurated cases. Its internal use in these affections is also widely recommended. *Boils*, *carbuncles*, and *kerion* do well, painted with pure ichthyol. In *ichthyosis*, baths of 1 per cent ichthyol, in which the patient is immersed for twenty minutes, promote exfoliation of the horny masses and softening of the skin.

Vaccines. Whitfield[8] in common with other observers, finds this treatment especially valuable in *furunculosis*, and prefers to give as an initial dose 250 millions of the autogenous staphylococcus, raising this by rapid increments. The injections should be continued so as to ensure freedom from boils for at least three months. In *pustular folliculitis*, *chronic pyogenic eczema*, and ordinary *impetigo contagiosa*, when contaminated as it always is in later stages by staphylococcus. Vaccines of these organisms are very useful. In early *sycosis* it is sometimes beneficial but frequently fails in cases of older standing, and in these depilation by x rays hastens the effect of the vaccine. In *erysipelas*, small doses of an autogenous vaccine of streptococcus (five million) followed by a second and perhaps a third of the same quantity, at five-day intervals, frequently results in complete cure. In *acne*, the mixed acne and staphylococcus vaccine should be used in combination with local remedies, and constitutional treatment for dyspepsia, constipation, etc. Vaccines have no influence on the underlying factor of seborrhea. In *lupus vulgaris*, treatment by **Old Tuberculin** is recommended if there is no evidence of visceral tubercle. The dose which gives no reaction is doubled until reaction occurs.

The author prefers other means of treating lupus, but vaccine therapy may be useful in combination with local methods. Tuberculin is especially useful in *Bazin's disease*, but must be administered here with greater caution. In *varicose ulcers*, vaccines have been disappointing. In *pruritus ani*, vaccines of *B. coli* and streptococcus have been tried with poor success. In *eczema* of the hairy scalp, vaccine therapy is of no practical use.

Gilchrist[9] described some interesting experiments and results of employing a filtrate of living organisms in *blastomycosis*. He also found some success in employing ointments made up with dead organisms in cutaneous infections, but these investigations are in too early a stage to yield practical suggestions for treatment. Vaccines from intestinal cultures were tried with some promise in certain diseases, e.g., *urticaria* and *erythema multiforme*, in which intestinal toxins are wont to play a causal part.

Human Serum.—Mayer and Linser experimented with injections of human serum in certain skin diseases, especially those occurring with pregnancy and in urticaria. Prætorius[10] reports a most remarkable cure obtained in an extremely severe and chronic case of *pemphigus* by a single intravenous injection of 20 c.c. of undefibrinated fresh human blood. This author regards the addition of living blood-cells as a most important advantage as compared with serum alone. Ravaut[11] recommends the following modification of the method advocated by Spielhof and Prætorius. Twenty c.c. of the patient's *own* blood are withdrawn from a vein and injected intramuscularly into the buttock. The dose may be repeated on the fourth and seventh days, and oftener if required. Pruritus was very markedly influenced by this method in *eczema* and *dermatitis herpetiformis*. Stumpke[12] has experimented with serum injections in a number of cases. In psoriasis and seborrhoic eczema no advantage was noticed from the injections, but in a pruriginous eczema there was considerable relief of the itching; in *prurigo of Hebra*, several injections of fresh undefibrinated human blood produced no effect, and the author, in contrast with Prætorius, found no relief of a severe pemphigus from these injections. In *lichen planus* serum injections produced in one case a cure within fourteen days; in another case great improvement resulted, but for other reasons the treatment could not be continued. In a case of *herpes gestationis* in a woman pregnant nine months, three injections of normal serum produced considerable improvement, but a complete cure resulted from two further injections of serum from a pregnant woman. In *urticaria*, blood transfusion was successful in removing wheals and relieving itching.

Haslund[13] as a result of a large experience in the use of **Carbon Dioxide Snow**, recommends it as the method of election in treating *lupus erythematosus* (exposures being on the average 12 seconds), in *rosacea* (exposures of 6 to 10 seconds), in *cavernous angiomata* (15 to 20 seconds), and in *warts* (maximum of 60 seconds). For port-wine stains and for rodent ulcers he prefers light or radium treatment.

Morton[14] reviews his later experiences with freezing by this reagent. He regards it as easily the best treatment for *nævi*, other than "port-wine stains," in which the effect is sometimes brilliant but uncertain. For hairy moles it is frequently disappointing, and electrolysis is probably to be preferred. For *warts* it is still the best method. For *rodent ulcer* it is not as overwhelmingly superior as this writer thought with earlier trials; but it remains, notwithstanding, a most valuable method. In the treatment of chronic circumscribed patches of *eczema* it is very useful. In *trachoma* it is preferable to other treatments.

[The writer uses carbon dioxide freezing extensively and with much satisfaction, both in the solid form and dissolved in ether. The latter method has been singularly successful in the treatment of ulcerating *lupus* of the nasal orifice and septum nasi, in varicose and chronic septic *ulcers*. He has found the stick method very useful in dissipating *gummata*, in treating soft *corns*, and in several cases of *dry lupus vulgaris*. For small *rodent ulcers* the writer still regards it as the best method at our disposal.—E. G. L.]

Bowen[15] remarks on the frequency with which ignorant use of **X-rays** results in disaster, and would restrict their legitimate use to: (1) Surgically inoperable *epitheliomata*; (2) Epitheliomata in cases in which the patient refuses surgical intervention; (3) Small cutaneous epitheliomata, in which the cosmetic result is very important; (4) *Sycosis* and obstinate *local pruritus*; (5) A few other cases, e.g., obstinate patches of *psoriasis* and *eczema*, *mycosis fungoides*, and a few rare affections of the kind.

Sibley[16] recommends **Electrolysis** in the destruction of *sebaceous cysts* in preference to their removal by the knife. An aluminium needle attached to the negative pole is inserted into the cyst, and a current of 5 milliampères continued for one or two minutes. If the cyst be large, another method is recommended: some drops of normal saline are injected into it, and two copper needles, one negative and one positive parallel but not touching, are introduced, and a current of 2 to 5 milliampères turned on for three to five minutes. The copper deposited round the positive needle may prevent its ready removal, in which case the current is reversed with the needle *in situ*. Both needles are then withdrawn and the wound is closed with collodion. The contents of the cyst are often expelled spontaneously through the opening, or may be squeezed out of it some four to seven days after the electrolysis. The procedure may be rendered painless by preliminary infiltration with 2 per cent solution of novocain.

Some useful general principles are enunciated for **X-ray** administration: (1) Any dose between ¾ and 1 pastille should not be repeated within three weeks. This dose is suitable for *ringworm, favus, keloid, hypertrichosis, angiomata, warts, nævi, rodent* and *epitheliomatous growths* generally. (2) A ½ pastille dose may be repeated at the end of two weeks and again in three weeks for *verrucose lupus, ulcerative tuberculosis*, and *tuberculous glands*. (3) A ⅓-pastille dose may be repeated at the end of a week, and again after two weeks, and then after three weeks' interval, for *chronic eczema, psoriasis, lichen planus, pruritus ani, vulvæ*, and *sycosis*. (4) A ¼-pastille dose may be repeated weekly. This is suitable for some forms of *alopecia*.

Simpson[17] reports a series of cases of different nature treated by **Radium** applications, which he extols in epithelioma, angioma, lupus vulgaris and lupus erythematosus, tuberculosis verrucosa cutis, persistent syphilides, blastomycosis, sycosis vulgaris, keloid, hypertrichosis, neurodermatitis, dysidrosis, ringworm of nails, lichen planus, psoriasis.

Mesothorium. Kuznitzky[18] recommends this agent in a number of diseases, comprising *carcinomata* and *rodent ulcers, warts, hæmangiomata, nævi*, and *lupus erythematosus*. The treatment is carried out by applying mesothorium in a capsule fixed over the part with strapping, and left in position for twenty minutes to an hour. The activity of the reagent is due to beta and gamma rays. As compared with radium the rays are softer and the superficial reaction more evident; it appears within a day or two of application as a light erythematous patch, which darkens to a brownish red at the end of a week, when serous exudation begins and superficial necrosis of the epithelium takes place. In the fifth week the crust which is at first formed generally falls off, and the scar left by this treatment is comparable with that obtained by carbon-dioxide freezing. The price of mesothorium (£7 10s. per milligram) makes the treatment of limited application. In the author's experiments capsules containing 20 mg. were used. (See also Tumours, p. [illegible].)

The use of **Adhesive Plaster** as a direct dressing for *wounds* and *ulcers* is recommended by Hutchins,[19] who thus describes the method: the skin is cleaned with benzine, and strips of adhesive plaster (one-inch width is recommended) applied either directly, when there is not much exudation, or with the interposition of cotton-wool when discharge is copious, in such a manner as to make an air-tight dressing, which must be renewed daily. The plaster need not be sterilized; no special make is recommended, but the author prefers zinc oxide adhesive plaster.

Salvarsan or **Neosalvarsan** powder, diluted with xeroform in 1-3 proportion, and dusted on the surface of *chronic ulcers* (one application followed by dry dressing with xeroform), is recommended by Alston.[20]

Organotherapy. Morris[21] usefully summarizes the evidence for associating certain disorders of the internal secretions with dermatoses. Thus he reasons that because **Thyroid Extract** is curative of myxœdema, it should be useful in skin diseases not myxœdematous, but having certain symptoms in common with that disease, e.g., *dryness* and *absence of perspiration, loss of hair.* He has found it advantageous in psoriasis, especially in adipose patients; in ichthyosis, alopecia, and xerodermia, pruritus and eczema, sclerodermia, keloid, warts, acne vulgaris, rhinophyma and rosacea, lupus and scrofulodermia, affections of the hair, including defluvium and premature greyness, degenerative change of the nails, and in abnormal pigmentations. The dose should be small, beginning with 2½ gr. in adults, and ¼ gr. in infants, and should be controlled by symptoms, of which nausea, rapid pulse, headache, and lumbar pain are the most important.

The *pituitary body* has close relations with the thyroid—in acromegaly and in goitre both glands are usually simultaneously affected. Hyperpituitarism is associated with hypertrichosis and hypersecretion of the sebaceous glands. Overgrowth of the long bones is ascribed to functional hyperactivity of the pituitary body, and may be accompanied by distention of the skin (striæ cutis distensæ).

The *thymus gland* probably has some vicarial relation with the sexual glands, and disorders of the thymus may be associated with *acne* vulgaris. Morris has used with advantage **Thymus Extract** in acne, **Pituitary** and **Suprarenal Extract** in persistent *urticaria* and angioneurotic œdema, and **Suprarenal** in *lupus erythematosus.*

REFERENCES.—[1]*Jour. Cutan. Dis.* 1913, 255; [2]*Jour. Amer. Med. Assoc.* 1913, i, 2035; [3]*Jour. Cutan. Dis.* 1913, 166; [4]*Ibid.* 322; [5]*Ibid.* 1912, 665; [6]*Ibid.* 705; [7]*Ibid.* 1913, 648; [8]*Proc.* xviith *Internat. Congr.* (*Med. Sect.*) xiii, pt. 1; [9]*Ibid.*; [10]*Münch. med. Woch.* 1913, 857; [11]*Ann. de Derm. et de Syph.* 1913, May (*Brit. Jour. Derm.* xxv, 375); [12]*Deut. med. Woch.* 1913, 1447; [13]*Arch. f. Derm. u. Syph.* cxviii (*Brit. Jour. Derm.* xxv, 374); [14]*Lancet*, 1912, i, 1730; [15]*Boston Med. and Surg. Jour.* 1913, 682; [16]*Pract.* 1913, i, 611; [17]*Jour. Amer. Med. Assoc.* 1913, i, 80; [18]*Arch. f. Derm. u. Syph.* cxvi, 1913, Apr. (*Brit. Jour. Derm.* xxv, 293); [19]*Jour. Cutan. Dis.* 1913, 470; [20]*Brit. Med. Jour.* 1912, ii, 1748; [21]*Ibid.* 1913, i, 1057.

SKIN, TUBERCULOSIS OF.

E. Graham Little, M.D., F.R.C.P.

Ehrlich's discovery of a drug which has a special affinity for the organism causing syphilis has stimulated other experimenters in the search for a similar agent in tubercle. Brück and Gluck,[1] apparently influenced by Koch's discovery, in 1890, of the peculiarly effective bactericidal power on the tubercle bacillus *in vitro* of solution of cyanide of gold, have experimented with very dilute solutions of **Potassium** and **Gold Cyanide,** first in rabbits, to determine possible doses, and then in human beings, and have evolved a system of treatment for which they claim a remarkable success. In a series of cases in which no other treatment was adopted, they were satisfied that the therapeutic effect obtained justified the conclusion that this drug has a specific effect on the tubercle bacillus. The drug is given dissolved in 50 c.c. of water, to adults in doses of ·02 to ·05 gram every two or three days; for children (from six to fourteen years old) in doses varying from ·005 to ·03 gram. The solution is freshly distilled, and freshly sterilized water is given intravenously, following exactly the same precautions as in injecting salvarsan. Local reactions rather like those following tuberculin injections may sometimes occur, but no serious constitutional effects were noticed in a large series of injections. A course of twelve injections is usually recommended, but this number may be exceeded. The authors later combined with the gold and potassium cyanide injections treatment by **Tuberculin**, and came to the decision that the combination worked more quickly and better than either method alone. The tuberculin was usually given twenty-four hours before the injection of the drug, and the dose was regulated by the usual consideration, being pushed to a point just short of the production of pyrexia.

Bettmann[2] confirms generally the conclusions of Bruck and Glück. He used somewhat smaller doses, beginning with ·01 gram in 30 c.c. of water, and gradually raised the dose to ·03 gram. The injections were given with intervals of at least two days. There were no serious symptoms noted in 250 injections. Some local infiltration and hæmorrhage occurred in one case, but this was not important. The method was tested with sixteen cases of lupus vulgaris; of these, thirteen had fourteen or fifteen injections, averaging about ·4 gram in thirty-two to forty-three days. The tuberculin used was varied; it was chiefly old tuberculin, in doses commencing at ·0001 gram and gradually raised. By this method rise of temperature was but seldom noted, and local reaction was quite moderate. Reuter[3] also used the combined method, and with satisfactory results in fifteen cases of lupus vulgaris or lupus erythematosus. In only two cases was there any untoward effect, one of these being a patient with severe constitutional illness and disseminated lupus erythematosus, in whom the rise of temperature to 103·5° F. may have been partly due to the general illness; the other was in a patient with lupus vulgaris of the cheek, who ten days after a second injection of ·03 gram developed a brawny infiltration of the arm, with loss of power and local hæmorrhages. Reuter gives injections of gold and potassium cyanide twice a week, commencing with ·02 gram and increased to ·05 gram. Injections of old tuberculin (1/10 to ½ milligram) were given from twenty-four to forty-eight hours before the intravenous infusion of the gold salt. Twelve such injections formed a course. Reuter agrees with Bettman in regarding the effect of these injections as cumulative; but he is less optimistic than the previous writers as to the future of the method in general practice.

REFERENCES.—[1]Münch. med. Woch. [illegible]; [2]Ibid. [illegible]; [3]Derm. Woch. [illegible]

SKIN-GRAFTING. (*See also* BREAST, CANCER OF.)

Priestley Leech, M.D., F.R.C.S.

Sabella[1] and Stern,[2] of New York, have published papers on the use of the *fœtal membranes* instead of skin for covering skin defects. If this method should justify the claims made for it, it will be of great use. Sabella uses the amnion and umbilical cord; these are examined, and enquiries are made as to the previous history of the patient, etc. If their appearance is healthy, they are placed in a bottle containing normal saline solution, after having been washed in warm water to remove any vaginal secretion, etc. When the patient is ready for grafting, the fœtal tissues are dipped several times in a new solution of normal saline, and then cut up into pieces in any shape and size desired. The cord is cut open, and the blood-vessels are scraped out; the surface of the cord and amnion which is to be placed on the ulcer should be the continuation of the inner surface of the cord. The area to be grafted should be carefully cleaned and disinfected; exuberant granulations should be levelled down, and any undermined edges of the skin must be cut away until healthy skin is reached; then the surface is thoroughly asepticized. All bleeding must have ceased; if oozing persists, the surface must be covered by a protective layer of rubber tissue, of silver foil, guttapercha tissue, or oiled silk, over which sterile gauze is applied, and the grafting put off till next day, when it may be finished if the bleeding has ceased. When the whole surface has been grafted, fenestrated oil-silk is placed over it, then sterile gauze soaked in decinormal salt solution or Carrel's solution, and over that a layer of rubber tissue, so that the moisture may not evaporate. Over this, more sterile gauze is placed, and then an ordinary dressing. The first layer of gauze is changed every day and replaced by gauze soaked in salt solution. In order that the grafts may not be moved by the daily dressing, the fenestrated oil-silk is fixed at its edges with collodion. Before grafting, Sabella cleans the area thoroughly with peroxide of hydrogen, which is washed off with a 1–10,000 mercury perchloride solution.

Stern uses a rather different method; the freshly obtained amniotic sac is washed clean in normal saline solution, dried between layers of sterile gauze, and immediately immersed in petrolatum which has been raised to the melting-point over a water-bath. The receptacles are stored on or near ice as soon as possible. The denuded surface is thoroughly cleansed of all secretion and bits of tissue, and (if infected) well washed with iodine or strong permanganate solutions; it is then treated with a perchloride dressing. Grafts are now taken from the petrolatum, spread smoothly on the surface, and a wax, composed of paraffin, bees'-wax, and castor oil, is melted, and spread over the graft with a little cotton wound on a wooden applicator to retain the graft in place, and then an outer dressing of cotton and a bandage. After two days the dressing is removed. The wax was suggested by Carrel.[3]

Wiener[4] has tried skin-grafting without the use of any dressing, and reports very good results. If there are any sinuses, these are plugged with iodoform gauze, but the grafts are left uncovered. Ten days after grafting, a weak ichthyol ointment is applied.

Staige Davis[5] reports a case of excessive formation of epithelium in grafts dressed with amidoazotoluol ointment; the patient has been under observation for two years, and there are no signs of malignant degeneration.

REFERENCES.—[1]*Med. Rec.* 1913, i, 378; [2]*Jour. Amer. Med. Assoc.* 1913, i, 921; [3]*Ibid.* 1912, ii, 521; [4]*Ibid.* 1913, i, 1426; [5]*Johns Hop. Hosp. Bull.* 1913, i, 158.

SLEEPING SICKNESS. (*See* TRYPANOSOMIASIS.)

SMALL-POX.

E. W. Goodall, M.D.

A curious and rare case of what appears to be a recrudescence of the eruption has been recorded by Fink.[1] The patient was a male native of Burma, aged 22. He went through a moderate attack of small-pox, which began on May 18th, 1912, contracted upon admission to gaol. On August 7th he was quite well and put to ordinary labour. He increased in weight and looked perfectly healthy. "On Sept. 20th, 1912, he had an attack of fever, but the temperature was not recorded. The following morning papules appeared, and some of them developed into vesicles. A few of these vesicles became pustular, and scabs formed. The lesions were in every respect similar to those of a mild case of chicken-pox or modified small-pox. The prisoner had not been in contact with any person suffering from either of these diseases. The eruptions were most numerous on the back and chest, and there were a few on the face and extremities. They were all very superficial, and the scabs were thin. On examining the hands, two 'seeds' (evidently remaining from the attack of small-pox in May) were found on the palmar aspect of the left hand, and one . . . on the right middle finger." The glands in the axillary and femoral regions were enlarged to the size of a pigeon's egg. By October 5th all the scabs had fallen off.

REFERENCE.—[1]*Jour. Trop. Med. and Hyg.* 1913, 321.

SNAKE-BITE.

Leonard Rogers, M.D., F.R.C.P.

A brief resumé of a report by W. B. Bannerman[1] on an investigation into the treatment of snake-bite by **Permanganate of Potash** has been published, in which a table of the results obtained in dogs with both cobra and Russell's viper venom is given. As pointed out by L. Rogers,[2] these experiments show from 50 to 84 per cent of recoveries of the animals which had received from one to three lethal doses of the venoms. Yet the author sums up his results as proving the method to be of no use whatever as a practical measure for employment after actual snake-bite. Rogers, after criticizing this conclusion as not being in accordance with the experiments recorded, gives a table of twenty-one cases of snake-bite in which the snakes, including cobras, kraits, daboias, and other vipers, were identified by reliable observers.

no less than twenty of which recovered under the local application of crystals of permanganate of potash by Lauder Brunton's method. No substitute for the treatment is suggested by Bannerman, so that the permanganate method remains the only practical measure in the vast number of instances, owing to the extreme unlikelihood of sufficient active antivenene being available when required.

F. W. Fitzsimons[3] has published a pamphlet on snake bite and its scientific treatment. As a result of prolonged experiments he has found that various alleged antidotes in use in South Africa are useless. He advocates permanganate of potash rubbed into incisions made at the site of the bite within five or six minutes of the bite as the only first-aid remedy, and the subsequent injection of **Antivenene.** He has patented an outfit containing both the first-aid apparatus to be carried in the waistcoat pocket, and antivenene syringes, and an illustrated booklet to enable the full treatment to be carried out.

REFERENCES.—[1]*Ind. Med. Gaz.* 1912, 381; [2]*Ibid.* 467; [3]"Snake Bite and its Scientific Treatment."

SPINAL CORD, SURGERY OF.

E. W. Hey Groves, M.S., F.R.C.S.

Newton[1] has carried out some most instructive experimental work on the subject of *concussion* and *compression* of the cord. He has worked with 50 animals, mostly cats, with a few monkeys and dogs.

A glass rod weighing 50 grams was allowed either to fall upon the cord from a measured height, or else to compress the cord for a given time. The following practical conclusions are drawn from these experiments: (1) The spinal cord is extremely sensitive to slight degrees of concussion and compression; (2) Despite the slight anatomical changes demonstrable after lesser degrees of injury, the resulting disturbance of function is considerable; (3) After concussion which has quite abolished motor efferent conduction, sensory conduction can still be demonstrated; (4) Arrest of the spinal-cord circulation by aortic compression abolishes spinal-cord function in from fifteen to thirty seconds; (5) These experiments support the view that there is an organic basis for the signs and symptoms of "railway spine" and allied conditions of traumatic neurasthenia.

Spinal Tumours.—SYMPTOMS.—As in the case of the brain, so with the spinal cord, one of the most pressing problems is the relation of surgery to the treatment of tumours. It was only in 1887 that a tumour of the cord was first rightly diagnosed and removed, and until recently such cases were regarded as rare curiosities. Now, however, that it is possible to collect over 600 records of spinal tumours, this view must be altered. And the point of greatest practical importance which is impressed on the mind by these facts is, that whereas spinal-cord tumours are in reality fairly common, they are often overlooked, and come to be classed among those hopeless cases of paraplegia or multiple sclerosis which languish without hope or treatment.

Potel and Veaudeau[2] have collected an immense amount of information on this subject. Tumours of the spine may be classified as

(1) Extra-vertebral; (2) Vertebral; (3) Intravertebral — (a) Extra-medullary, (b) Intramedullary.

The *extra-vertebral* tumours are those which arise in adjacent organs and thence spread to the interior of the spine, either by erosion of the bones, or much more commonly by fungating through the intervertebral foramina. In 72 per cent of cases the tumour is a sarcoma, in 10 carcinoma, and in 10 hydatid cyst. The origin of these growths may be from the muscles of the neck and back, or from the mediastinum and abdomen.

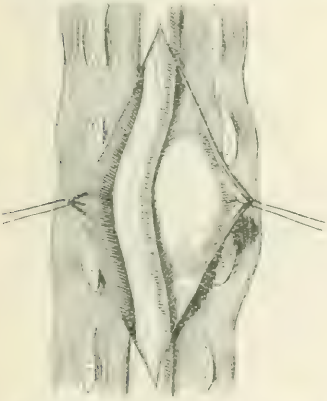
The invasion of the spinal cord and nerve roots is signalized by symptoms very similar to those attending tumours of the vertebral column itself. Wherever the posterior face of the spine is the seat of the growth, it should be attacked, directly there is evidence of cord involvement, because although the growth may be malignant and liable to recur, a free removal of laminæ will relieve the cord from both pressure and destruction. When the tumour grows into the spine from in front, nothing can be done.

Vertebral tumours constitute about two-thirds of all spinal growths, and of their number over 80 per cent are malignant growths secondary to breast cancer. The primary disease which gives rise to them is of a very chronic character. The symptoms have a general resemblance to those of Pott's disease. Bone deformity, however, when present, is not angular as in tuberculosis; it takes the form of a long gentle curve because a number of adjacent vertebræ are softened simultaneously. In addition to this, and the presence of a primary growth, these cases are distinguished from Pott's disease by the absence of pain on pressure, and by the fact that rest in bed causes no improvement in the pain. The root pains are the most prominent symptom. They are very severe, bilateral in distribution, and of long duration. The evidences of cord pressure come on long after those of root irritation, and consist in the usual sequence of spastic paralysis with exaggerated reflexes, flaccid paralysis with absent reflexes, and paralysis of sphincters. The course of these cases is usually about one year. There is no kind of radical treatment available for such conditions, but various attempts have been made to relieve the intolerable root pains. This has mostly taken the form of resection of various posterior roots, but it has met with but little success, owing to the necessity of exposing the roots at the site of the growth and the rapid extension of the disease after operative interference. Lately, the proposal has been made to divide the paths of pain-conduction in the antero-lateral column of the cord on the side opposite to that of the pain, or on both sides. This has the advantage of being feasible at some distance above the growth, and of not requiring more than a small exposure of the cord. (See MEDICAL ANNUAL, 1913, p. [illegible].)

There are records of about 27 cases in which operation has been done for the relief of pressure on the cord. Of these, 13 have been benefited, and there are a few cases, comprising primary hydatid disease, exostoses, enchondroma, and sarcoma, which have been cured.

It is the *extramedullary* sub-group of intravertebral tumours (*Figs.* 56, 57) that is of the greatest surgical interest, because, in sharp contrast to cerebral tumours, the great majority are either benign or of a very low malignancy, and early operation is attended by slight risk and a good prospect of permanent cure. The growth is in most cases a well-defined oval fibro-sarcoma or purely fibroid tumour (80 per cent.), and the remainder are made up of endotheliomata, angiomata, hydatids, and carcinomata. The cervical region is affected in 20 per cent, dorsal in 52 per cent, lumbo-sacral in 18 per cent. In gross character, the tumour in 95 per cent of cases is solitary, easily isolated, and it is situated outside or inside the dura mater in about equal proportions.

The symptoms caused by these growths may be divided into three stages, although these are often not sharply marked from one another.



[illegible] tumour lying [illegible] dura.

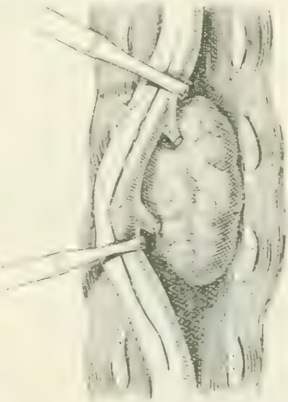


Fig. 57.—The tumour after removal of dura. Note the relation to two nerve roots on one side, which have been cut.

1. There is pressure upon the nerve roots. This causes pain of a very intense character, which the patient locates in a definite spot in the periphery. When the growth is in the dorsal region, for instance, the pain shoots along one of the intercostal nerves, or is most intense in the hypochondrium. Having begun on one side or at one spot, it tends to spread further, but the seat of origin remains as that of the maximum intensity. Markedly unilateral pain is specially characteristic of intradural growths. This stage lasts for a year or more before symptoms of cord pressure arise, and it may terminate by a condition of flaccid paralysis with atrophy of muscles, due to a compression of the motor elements of the nerve roots.

2. Then appear the phenomena of the unilateral cord pressure, i.e., a modified Brown-Séquard paralysis, movement being diminished on the side of the lesion, and sensation on that opposite to it in the parts below the tumour. The presence of this special phase of extramedullary tumours will evidently only be present when the growth

is unilateral, but when it is absent the absence has no special significance.

3. There is compression of the cord. The first evidence of this (apart from the above-mentioned second stage) is spasticity, with motor weakness, accompanied by an increase of reflexes and the development of painful involuntary contractions. This is gradually succeeded by flaccid paralysis, with paralysis of the sphincters. Sensation is lost to a less degree, and long after motion.

The *intramedullary* tumours (*Figs.* 58, 59, and *Plate XLV*) are fortunately much rarer than the last class. They affect the dorsal region most commonly (50 per cent), next the cervical (33 per cent), and all other regions together (17 per cent). They are always gliomata or sarcomata of some type. In rather more than half the cases the tumour is encapsuled and therefore removable. They are always solitary, without any tendency to spread to other parts or to cause secondary growths. Their presence in the cord is revealed, after opening the dura, by an absence of pulsation, some modification of feeling or appearance, or by a fusiform swelling. The symptoms are much less definite in their character and sequence than in the case of extramedullary tumours. Pain is usually absent, because there is no direct pressure upon the roots. Motor paralysis of a limited distribution occurs, and *pari passu* with it is atrophy, accompanied by fibrillary contractions. The atrophy and paralysis ascend gradually as the tumour grows in length. The sensory symptoms are vague and indefinite, the most characteristic being the dissociation of sensation such as occurs in syringomyelia, there being a loss of pain and temperature sense without tactile anæsthesia. The intramedullary tumour grows in the axis of the cord, and therefore, as

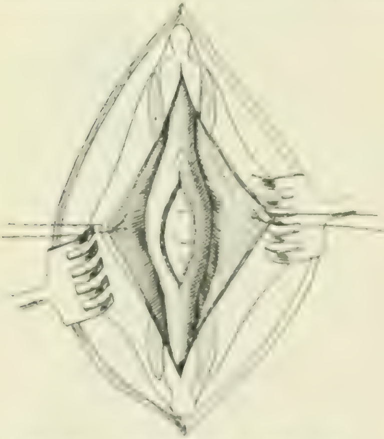


Fig. 58.—Intramedullary growth (after Elsberg). The tumour is then seen through a longitudinal incision in the cord.

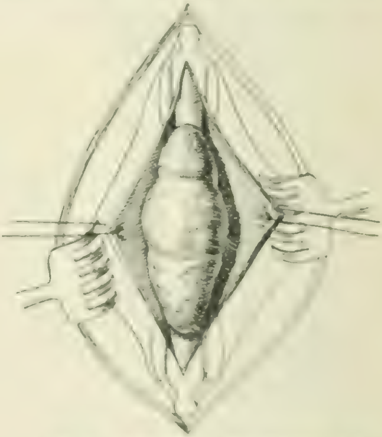


Fig. 59.—The tumour has extruded itself so as to lie upon the surface of the cord.

PLATE XIV.

EXAMPLES OF INTRASPINAL TUMOURS

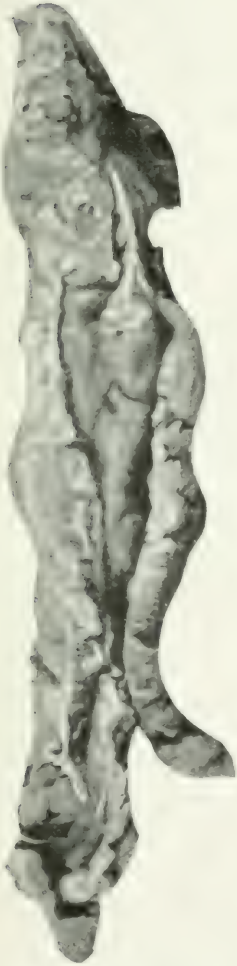
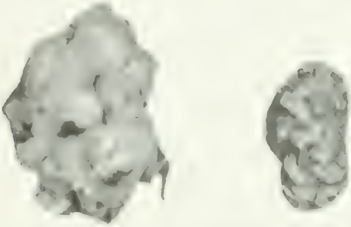


Fig. A.—Very large tumour of [illegible]



[illegible] tumours successfully removed at operation.

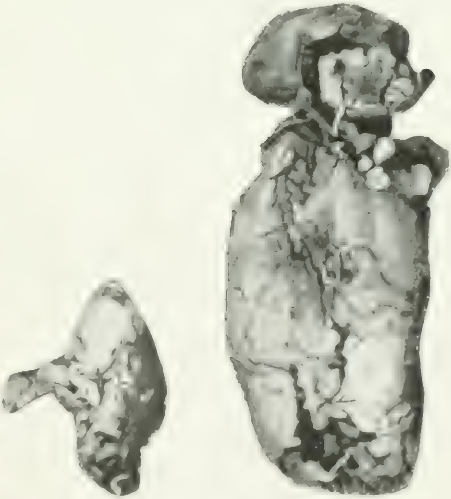


Fig. C.—Examples of intramedullary spinal tumours [illegible]

the case progresses, there is merely an extension in the area of atrophic paralysis, rather than an increase in the evidence of compression such as occurs in the extramedullary tumours.

Diagnosis.—Many points have already been mentioned, and the matter may be summarized under the following headings:—

1. Diagnosis of an intravertebral tumour has to be made from disseminated sclerosis, certain forms of lateral sclerosis, and spinal serous meningitis. As regards the latter, the distinction is perhaps not of great practical importance, because in either case a laminectomy will be required.

2. The diagnosis of extradural from intradural growth is also not of great importance, as it will be cleared up by operation. Well-marked symmetry of root pains points to an extradural, unilateral signs to an intradural growth.

3. Diagnosis of the level of the tumour is as difficult as it is important. There are many cases in which an operation has failed to find a tumour which has been revealed on the post-mortem table. The chief difficulty arises from a confusion between the level of segmentary compression and that of the loss of conduction. For example, when an intramedullary growth is in the dorsal region, there may be no root pains, and muscular paralysis with atrophy is difficult to detect in the intercostal regions. Altered sensation and motor weakness in the legs may misdirect attention to the lumbar region of the cord. The general mistake is therefore to seek for the tumour too low, and it is a good rule to be guided by the highest level of altered sensation. Further, when nothing is found, but the cord is not pulsating, it is wise to open up the laminæ above, until the tumour is reached, or at any rate a part of the cord which shows normal pulsation. There have also been a few cases in which the tumour was sought too high, this being due to an œdema above the growth causing segmentary symptoms above it. The most important factors in settling the level of the growth are: (*a*) The earliest pains of onset, which, being generally root pains, correspond to a segment of the cord situated some distance higher than these roots the cervical segments are 1 vertebra higher up than the roots connected with them, the upper dorsal 2, and the lower dorsal 3, whilst the last dorsal to the fifth sacral roots inclusive are all opposite the last dorsal and the 1st lumbar vertebræ; (*b*) The site of muscle atrophy; (*c*) The hyperæsthetic zone above an area of anæsthesia, or in the absence of this, the upper level of anæsthesia or dissociated sensation. (As every part is supplied with sensation by at least three consecutive sensory roots, the level of the tumour will be at least three segments above the level indicated by the upper margin of altered sensation.)

Treatment.—In all cases of intravertebral tumours of the cord this consists in **Removal**, when possible, after a free laminectomy. There are, however, a few points which require discussion:—

1. *The simple removal of laminæ as compared with the use of an osteoplastic flap.* There is really nothing to recommend the latter—it is

merely a dissecting-room demonstration. There is no evidence that the strength or rigidity of the spine suffers from the removal of even five or six laminæ. Further, it has been shown that the bones in an osteoplastic flap undergo atrophy, and there is great danger of the ill-nourished flap sloughing. A simple laminectomy is easy, safe, and rapid, and it can readily be enlarged in either direction.

2. *The posture of the patient.* Probably the lateral position is the best, because the fully prone position causes weight on the chest and embarrassment of respiration. An elevation of the pelvis is of advantage in saving excessive loss of cerebrospinal fluid, but this latter point is one to which surgeons seem to attach but little importance, with an increase of experience.

3. *The anæsthetic.* Krause has employed local anæsthesia, novocain 1 per cent with adrenalin solution 1–50,000. Probably when surgeons become familiar with the advantages of the intratracheal ether method, this will be always used in these cases, as it ensures complete aeration of the blood with the minimum of shock or respiratory embarrassment.

4. *Exploration.* When the tumour is not at once discovered, it may be sought by use of a sound or catheter, passed first between the dura and bones and then between the dura and pia. If the cord, by its absence of pulsation, firmness, or bulging, gives indication of an intramedullary growth, it should be incised in a longitudinal direction to one side of the longitudinal fissure (to avoid the posterior spinal arteries), and the growth will then extrude itself either at once or after the lapse of some days (see *Figs.* 58, 59). In the latter event it is to be removed at a subsequent operation.

The mortality of the operations from spinal cord tumours has dropped from 45 per cent to 15 per cent, and it would no doubt be much lower if cases came earlier for operation. It is to Elsberg[1] that we owe most of our knowledge of the possibility of the removal of intraspinal tumours by spontaneous extrusion. The figures on *Plate XLV* are from his cases, and illustrate well the size and shape of both extra- and intramedullary growths.

Surgery of Nerve Roots.—Foerster[2] has given a recent summary of the results of the operations of the resection of the posterior nerve roots, together with his latest views upon the subject.

The operation has been done for pain 40 times, and of these only 12 were successful. Those in which the relief of pain has been immediate and absolute in the way in which we should have expected, were cases where only a single root was affected. The most disappointing cases have been those of limb neuralgia, whether this has been of spontaneous or traumatic origin. From this it is clear that in such there is so wide a diffusion of pain sensation among adjacent nerves that it will be impossible to abolish it without very extensive root division. Foerster actually declares that to abolish pain in the arm, we must divide from the third cervical to the third dorsal (i.e., nine consecutive roots), and for that in the leg, from the tenth dorsal to the fifth sacral (i.e., twelve consecutive roots). Such an extensive nerve resection could only be justified if the pain was in the stump of an amputated limb, because of the extreme ataxia that would be produced by it.

For visceral crises the operation has been done 64 times, and of these 6 died at once and 4 others shortly after. There were 56 successful cases, some of them having relief maintained for several years, but most having been too recent to judge of the final operative results. In cases where failure has occurred, the division of the roots has not been extensive or radical enough. In Foerster's first case, only the seventh to the tenth dorsal roots were cut, but now he says that it is better to include from the sixth to the twelfth, because there is some variation in the course of the sympathetic nerves from the stomach to the cord. As evidence that the roots have been thoroughly divided, there should remain a permanent zone of absolute anæsthesia from the mammary level to that of the navel.

For spastic contractions there have been 159 operations, with 14 deaths. It can now be clearly predicted which cases are likely to give good and which bad results. Those unsuited for root resection are cases of disseminated sclerosis and other rapidly progressive cord diseases. Further, the arm cases have so far given but poor results. Good cases are those in which the disease is stationary, and in which there is sufficient mental intelligence to carry out physical exercises afterwards. Then, of the utmost importance is a preliminary estimation of the degree of paralysis which is present in addition to the spasm. This may be done by an intraspinal injection of stovaine, which abolishes the spasm and allows the degree of voluntary movement to be estimated. In operating for spastic contractions of the leg, Foerster now holds that five roots ought to be cut: the usual ones are the second, third, and fifth lumbar, and the two upper sacral. The fourth lumbar is left, because it guarantees the extensor reflex of the knee which is so very necessary for standing and walking. Unfortunately, there is some variability in this phenomenon, and the second or third lumbar may be the important root instead of the fourth; so that now Foerster always assures himself of this point by electrical stimulation of the roots at the time of the operation. He gives the following table showing the effect of such stimulation.

Second sacral root—Plantar flexion of toes, and of foot
First ,, ,, —Plantar flexion of foot, flexion of knee
Fifth lumbar ,, —Flexion of knee, extension of hip
Fourth ,, ,, —Dorsal flexion of foot, outward rotation of hip, extension of knee, sometimes flexion of knee
Third ,, ,, —Extension of knee, adduction of hip
Second ,, ,, —Extension of knee, adduction of hip, flexion of hip
First ,, ,, —Flexion of hip.

Foerster himself still prefers the identification of the roots at their exit from the dura, which involves the removal of all the lumbar laminæ. But it has been urged by various authors that this is quite unnecessary, because all the lumbar and sacral roots can be exposed by a laminectomy of the last dorsal and first two lumbar vertebræ. (*See* MEDICAL ANNUAL, 1913, 455.) The objection to this is that the filaments of the posterior roots lie so near together that they cannot be accurately counted. Elsberg[5] has made a valuable contribution to the solution of this problem. He has pointed out that the ligamentum denticulatum terminates by a forked end just opposite to the first lumbar nerve, so that this identifies the highest of the series (*Fig.* 60). Now as the last nerve of any considerable size to be given off from the conus medullaris is the third sacral, we have a means of recognizing the last of the series also, and it ought therefore to be easy, if all the posterior nerves, from the first lumbar to the third sacral, are lifted up on a director, to enumerate them accurately.

In France there has been a strong disposition to adopt Franke's operation of *avulsion of the intercostal nerves* instead of the intravertebral resection of the posterior roots, for the cure of visceral crises.[6] Sauvé and Tinel give a very careful account of the technique of this operation.

In order that Franke's operation should afford radical relief, it is necessary either that the posterior root ganglion should be torn out, or that at any rate the ramus communicans from the sympathetic should be severed. This must be a matter of some uncertainty, and the method is therefore anything but precise. Moreover, the operation has a mortality of 14 per cent, which perhaps compares favourably with the 24 per cent which attended Foerster's operation when first performed for visceral crises, but is practically identical with that of the operation results of all the cases (94 with 13 deaths). This robs Franke's operation of its only claim to recognition as a surgical advance. As it was at first suggested, a mere avulsion of the intercostal nerves was supposed to be attended by no fatal risks; but the fact is that in the effort to reach the roots of the nerves, the safety has been lost. Mouriquand and Cotte[7] point out, in a case of their own, that after the original Franke's operation the area of anaesthesia rapidly diminishes, and they explain how the paths of regeneration of the splanchnic nerves are left intact. Sicard and Desmarest[8] put the matter clearly when they say that Franke's operation is either useless or dangerous. That is to say, if it is done without close approach to the intervertebral foramina, it will only cause transient relief. If the operative attack is pushed further, it involves danger of tearing the dura and opening the pleura (*Fig.* 61). They mention three cases in which fatal pneumothorax was caused by the more extended type of the operation, and this seems to have been the cause of death in most of the fatal cases.

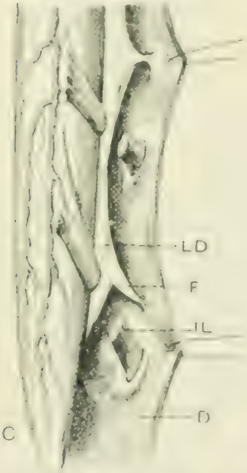


Fig. 60.—The cauda equina and the ligamentum denticulatum, LD, showing the 'fork,' F; C, conus; D, dura and spine; IL, first posterior lumbar root. The cord has been drawn to show the end of the dentate ligament.

The Possibility of Root Anastomoses Inside the Spinal Theca.—Frazier[9] has made an important contribution towards progress in nerve surgery by pointing out the possibility of intrathecal anastomosis of nerve roots. His patient was suffering from paralysis of the bladder as the result of old cord injury. The lower end of the cord was exposed, and the first anterior lumbar nerve root above joined to the third and fourth sacral below. The patient made a good recovery; four months later he had some power of retention of urine, and in eight months he had acquired some expulsive power. Kilvington has demonstrated experimentally in dogs that the intrathecal anastomosis of the ventral nerve roots is possible. He gives a table which shows the anatomical possibilities of the method, by which the atrophied nerves in poliomyelitis may be regenerated from those not affected. For example, the eleventh and twelfth dorsal nerves may be joined to the third, fourth, and fifth lumbar, or to the first, second, or third sacral. If these observations should prove to be well founded, there can be no doubt that they open up a wide field for advance.

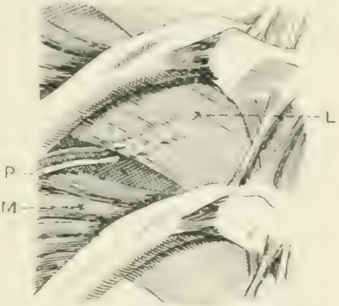


Fig. 61. Shows the intimate relation of pleura to intercostal nerve. **L**, Posterior ext. intercostal membrane; **M**, Internal intercostal muscle. **P**, Pleura.

REFERENCES.—[1]*Brit. Med. Jour.* 1913, i, 1101; [2]*Rev. de Chir.* 1913, i, 713; ii, 477; [3]*Surg. Gyn. and Obst.* 1913, i, 117; [4]*Ibid.* 463; [5]*Amer. Jour. Med. Sci.* 1912, ii, 799; [6]*Surg. Gyn. and Obst.* (*Internat. Abstr.*), 1913, ii, 53; [7]*Presse Méd.* 1912, 708; [8]*Ibid.* 921; [9]*Surg. Gyn. and Obst.* 1913, i, 552.

SPINE, INJURIES TO.

Priestley Leech, M.D., F.R.C.S.

Pseudo-Fracture of Transverse Processes.—Three years ago Rhys[1] published a radiograph showing an apparent separation of the left transverse process of the first lumbar vertebra in a man who had received no injury. Since then he has seen three other cases. In injuries to the back in workmen's compensation cases such a radiograph might easily be misinterpreted. He has knowledge of an instance where a surgeon proposed to cut down and remove what had been diagnosed as an ununited fracture of a transverse process. All the patients were adults between twenty and sixty. In one only there was a definite history of muscular strain.

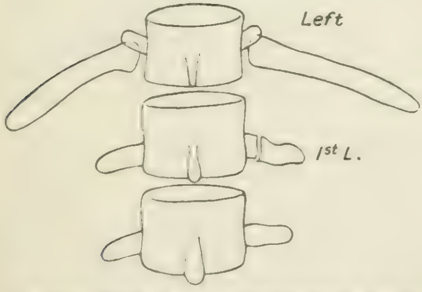


Fig. 62.—Showing a typical pseudo-fracture of the first lumbar transverse process.

Rhys thinks it is a developmental defect. The epiphyses of the transverse processes are not united until the twenty-fifth year, and in the embryo there is a costal element in connection with the transverse process of the first lumbar vertebra which occasionally develops into a rudimentary supernumerary rib (*See Figs.* 63, 64).

Fig. 63.—First lumbar, showing [illegible]

Fig. 64.—[illegible]

Reference.—[1]*Brit. Med. Jour.*, 1911, i, 1103.

SPINE, LATERAL CURVATURE OF: TREATMENT BY EXERCISES.

J. S. Kellett Smith, F.R.C.S.

During the past year fresh interest in the subject of lateral curvature of the spine has been aroused chiefly by Abbott's[1] method of treating advanced cases by over-correction and fixation with the spine in a flexed position. The treatment of the earlier cases by means of exercises scientifically applied has also received attention. Success in this latter direction depends upon three factors: careful selection of cases; choice of exercises suitable to each particular patient; and skilled supervision, with attention to all details of the patient's life.

Selection of Cases.—It is convenient to divide all cases into three grades according to the degree of deformity: Grade 1, those in which the spine may be straightened out to normal by posture; Grade 2, those in which the spine may be straightened out to some extent by posture, but in which some measure of the deformity still remains; Grade 3, those in which the deformity is so pronounced that radical changes in the shape of the ribs, and inferentially of the vertebræ, are palpable, and in which the alteration produced by posture is inconsiderable.

The cases in Grade 1 include those often termed "postural," "functional," "flexible," "curvature without bony deformity," "curvature without fixation," etc. Those in Grades 2 and 3, in which the curvature is more or less fixed, present an increasing amount of bony alteration, affecting chiefly the ribs to begin with, and running on to wedge-shaped deformity of the vertebral bodies.

Broadly speaking, cases of Grade 1 and of early Grade 2 give excellent prospects of a good result by the employment of exercises. The later the case, the more the gymnastic treatment tends to sink to a secondary position and become an auxiliary to mechanical means of correction. But it is essential also in any one case to take into account the cause of the deformity and the personal characteristics of the patient. Cases due to weakness of the spinal structures following quick growth or illness are quite favourable. Cases resulting from bad habits of sitting and standing, actuated in the abnormal child by deformity of the pelvis, difference in the standing height of the legs[3] (unequal growth, flat-foot, etc.), wry-neck, errors of vision, deafness, etc., are also promising when the cause is corrected. Cases with an underlying rachitic or general constitutional asthenic (Stiller) tendency are less favourable, and demand constant care to avoid relapse. Cases arising from paralysis, empyema with structural after-effects, or defects of development in the ribs or vertebræ, must each be judged on its own demerits. Exercises alone, or in conjunction with other methods, may or may not result in general and local improvement.

The age of the patient, both at the onset of the deformity and at the beginning of treatment, is important. "Generally speaking, the earlier the deformity develops, if it goes on for several years without treatment, the worse the prognosis; but where the deformity in young children is detected early and given prompt treatment, we should expect excellent and speedy results" (Porter[4]). This prognosis must be considered in relation to the cause of the curvature; and it may also be stated, as a general deduction, that in any case, the longer the period of growth ahead during which treatment can be carried out, the better.

The patient's mentality may have an important bearing upon the conduct of the case. The young girl passes through a period of rapid growth somewhere between her tenth and fifteenth years, and it is during this period that she is especially prone to develop a spinal curvature. Under ordinary circumstances, this causes little trouble in treatment when detected early, and if the patient be otherwise healthy; but occasionally the mental powers seem to undergo an eclipse for the time being, and this may prove a serious factor. Two types may be recognized. In the first, the patient is of the "wiry" build, and is intellectually acute beyond the average; but she is incapable of sustained mental, and therefore of sustained physical, effort; her mental energy, so to speak, is deficient in quantity. The patients of the second type are usually well grown and of rather sluggish temperament, having not much mental or physical initiative; big-jointed, with loose ligaments, often presenting over-extension of the elbows, weak ankles, flat-foot, etc. They are affected in a marked degree with that lack of muscular sense which is so frequently noticed in subjects of spinal curvature. Both types are incapable of exerting any valuable measure of self-help. They are cases for combined treatment—exercises for correction of the deformity and general development, and a light spinal support during the hours of activity to prevent relapse into vicious attitudes.

Finally, it is desirable to draw especial attention to certain cases which have not received the prominence they deserve, viz., those in which the spinal deformity is dependent upon, or is associated with, some visceral lesion. An inflamed or tender viscus may influence the spinal column in two ways. The patient may assume an habitual vicious attitude in order to relieve pressure, or localized contraction of muscles may be provoked by reflex irritation. Both causes may be in operation at the same time. Pain is so often referred to the back that attention is concentrated upon the spine alone, and if the curvature be treated without recognition of the underlying cause no good result is to be expected. The association between various viscera and the regions of the spine they are apt to affect reflexly is shown in the following table (Cyriax); hyperæsthesia of the skin, with increased tonus and irritability of the underlying muscles in those regions, are often very marked :—

Heart	3rd and 4th left dorsal segments
Stomach, cardiac end and fundus	6th, 7th, and 8th left dorsal segments
Stomach (pyloric end) and duodenum	6th, 7th, and 8th right dorsal segments
Small intestine	9th–11th dorsal segments
Liver and gall bladder . .	8th and 9th right dorsal segments
Kidney	10th–12th right dorsal segments
Spleen	9th and 10th left dorsal segments
Ovary	12th left dorsal segment. (Also 5th lumbar and 4th sacral.)

In like manner, the anterior abdominal muscles may also show increased local tonus and so affect the spine in cases of constipation, appendicitis and other inflammations of the intestinal tract, pelvic pain at the menstrual periods, etc. These cases, although comparatively few in number, demand such particular treatment that no examination of a case of spinal curvature, especially in older subjects, can be said to be complete unless the state of the internal organs has been enquired into.

Choice of Exercises.—The number of exercises recommended for employment in lateral curvature is very great, for the simple reason that the groups of muscles responsible for maintaining the equilibrium of the spine are brought into action in the vast majority of the movements of the body. In making choice it is wise, therefore, to consider the exact objects to be attained, and to this end a brief reference to some of the skeletal changes which take place in the more advanced stages is necessary.

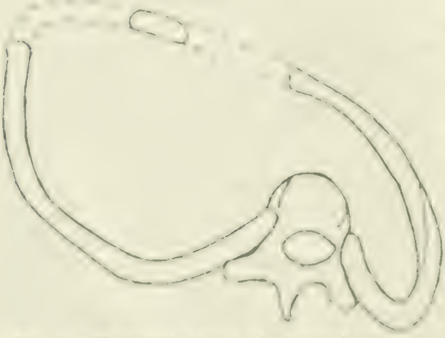
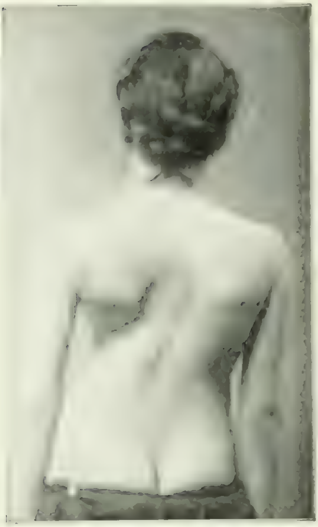


Fig. [illegible].—Horizontal section of advanced scoliosis.

When the rotation of the vertebræ commences in the dorsal region, the ribs on the convex side of the curve are carried backwards, and those on the concave side are

PLATE XVII.

SCOLIOSIS



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pushed forwards, but the thoracic cage does not move round as a whole—the sternum remains more or less in the middle line. Even in later cases its displacement is not great; its lower end is pushed over to one side or other, but the upper end remains anchored by the clavicles and by the first and second ribs. Therefore the brunt of the torsion falls upon the longer ribs on either side, and the final consequence is shown in *Fig.* 65.

The great fact to recognize is that this bending of the ribs by the "screwing round" process results in fixing the curvature long before any serious wedge-shaped alteration in the shape of the vertebral bodies has time to develop. In other words, the spine, which in the earlier stages is "whippy" enough to present no trouble in itself, is prevented from going back to mid line by the deformity of the ribs. The first object of exercise then is to overcome this fixity, to restore the correct form of the ribs as far as possible, and to render the thoracic skeleton so mobile as to be capable of being completely or partially restored to its normal position. The second object is to strengthen up the spinal muscles to such a degree that they are capable of maintaining this improved position.

CREEPING EXERCISES.

The most important method of obtaining the first object, and at the same time laying the groundwork for the second, is one which is little practised in this country. It has been called the *creeping method*,[6] and is best explained by means of a model, such as is shown in *Fig.* 66 A, constructed of flexible gas-tubing to represent the spinal column, and wire bridges to represent the pelvic and shoulder girdles respectively. This model is placed in the "all-fours" attitude and pinned down to a drawing-board. *Fig.* 66 B shows the principle underlying the most useful movements of the series. Here the leg of one side and the arm of the opposite side are moved forwards. The effect upon the spine through the assumed obliquity of the pelvic girdle is very evident, and that through the loose shoulder girdle may be intensified by inclination of the head, neck, and upper part of the trunk towards the side of the stationary arm. The total effect is the production of a simple curve in the manner illustrated; and this particular movement—right leg and left arm forwards—will evidently unfold a spinal curve which is convex to the right. *Fig.* 66 C shows the effect of advancing the leg and arm of the *same* side. A double curve is produced, and a movement such as this may be used to neutralize a contrary double curve in the spine of the patient.

Exercise I.—This is founded upon the principle of *Fig.* 66 B, and occupies most of the patient's attention. *Plate XLVI* is reproduced, with his permission, from Professor Klapp's handbook,[7] and depicts the subject of an advanced double curve carrying out the exercise. The patient goes down upon hands and knees. The right knee is advanced, not in a direct line forwards, but so that it comes to rest in front of, or even to the left front of, the left knee. By this crossing movement the maximum effect upon the pelvis and spine is produced. Then the left hand is taken circling from behind forwards in a wide, upright sweep, the trunk being at the same time pitched sideways and strongly inclined towards the stationary right hand. It is to be noted that the hand is not merely picked up from the floor and held above the head; the "windmill" swing is helpful in producing the side bending of the trunk. This part of the movement up to the point shown in *Fig. B* is done with somewhat of a jerk, the patient making a strong effort to unfold the dorsal curve, and a slight pause is made when the arm is stretched out to its maximum. The hand is then

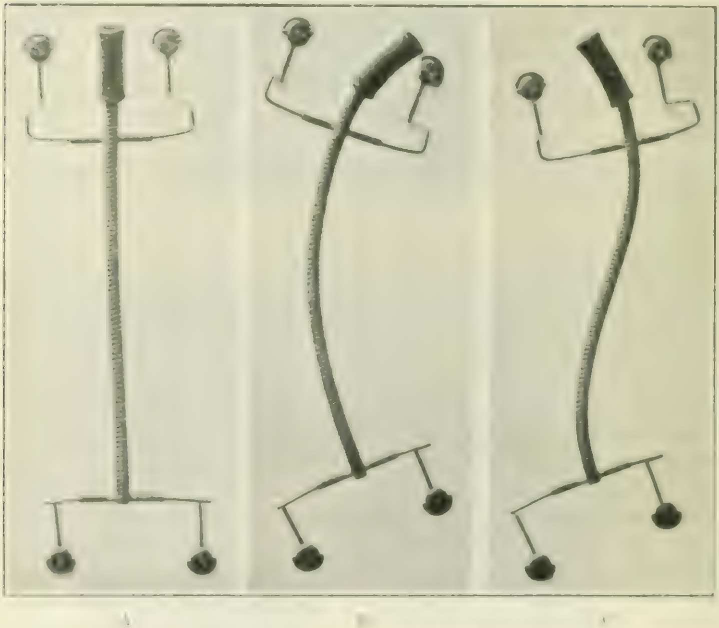
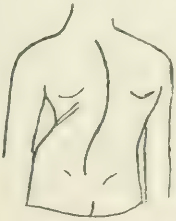


Fig. [illegible].—Model to illustrate the swinging movement.

brought to the ground, being placed rather wide of the body (note the position of the right hand in the figure) in order to give proper balance for the next phase. This consists in advancing the left knee across the right one, pivoting upon the latter to do so, and repeating the arm and body movements towards the left side.

The exercise is by no means a violent "plunging" one; it is rather of the slow, sinuous type; and although the upswinging of the arm is done rather quickly, yet its descent is slow, and it is a good plan, in teaching young children, to count five in seconds-time during each complete side action, so that the rate of performance comes to about six double movements to the minute.

The gravity of the curvature in the rib-bound dorsal region has already been insisted upon. On this is based a golden rule of practice. In cases of more than one curve, when there is any doubt as to the method of employing any exercise, *treat chiefly the dorsal curve.* Therefore, in this exercise, *the movement which unfolds the all-important dorsal curve is made more energetically, and is dwelt upon a little longer, than its fellow.* For this reason, when the exercise is done in an ordinary room, the patient should always creep round with the dorsal convexity towards the centre, the more important movement being given more space thereby and being favoured by the curve of the body as it progresses around the circle. The patient illustrated in *Fig. A*, for example, would have her right side—the side of the dorsal convexity—towards the centre of the room, and would travel in the direction of the hands of a watch. A patient with a left dorsal convexity would travel in the opposite direction.



It will be evident to the student, after a little experience, that the unfolding effect of this exercise may be located chiefly in the dorsal or in the lumbar region, according as the shoulder or the pelvic girdle is the more strongly side-tilted. The progression along the exercise floor of a patient with a marked double curve is shown in diagram in *Fig.* 67. Here the maximum effect in the first step is thrown so as to treat the dorsal curve, the shoulder girdle being mainly acted upon. In the second step the pelvis is the more strongly tilted, with the result that the abnormal lumbar curvature is erased.

In treating patients with simple total curvature presenting some amount of fixation, it is sometimes advisable, especially in the beginning, to employ the strong corrective action alone. In this case, the following movement consists of a simple pace forwards, during which the advancing knee is not crossed over its fellow and the arm is not swung aloft, and which merely serves to bring the patient into position to repeat the corrective effort.

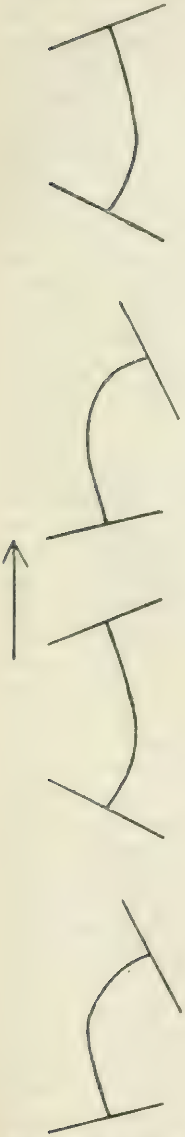
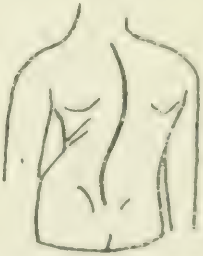


Fig. 67.—Diagram of the first exercise in a case of double curvature.

Exercise II.—This is a variation of No. I, but places more strain upon the erector spinæ muscles. The hands rest, thumbs backwards, upon the iliac crests, and the shoulders are kept braced well back. The trunk leans forwards from the hips, and as the patient progresses on the knees is inclined laterally towards the side of the advancing foot (*Plate XLVII, Figs. A and B*). In order to preserve the balance, the knees advance in a direct line, without any of the crossing movement advisable in Exercise I. In this exercise also, the movement which unfolds the dorsal curve is made more strongly than its fellow, and the same rule of travelling with the dorsal convexity towards the centre of the room applies.

Exercise III.—This is founded upon the principle of *Fig.* 66 C, i.e., the limbs of the *same* side are advanced together. It is of most use in those cases of double curvature which present also a marked degree of kyphosis.



The first thing to notice is that it is carried out with the thorax kept low to the ground. Hence it is known as the low-creeping movement, in contradistinction to Exercise I, which is the high-creeping movement (*Plate XLVI, Fig. B*). The object of keeping the thorax low is to attack the kyphosis: with the pelvis high and the shoulders low, the spine sags in such a way as to correct this, and the effect may be increased by holding the head well back. *Plate XLVII, Fig. C*, represents the strong corrective movement in a case of double curvature convex to the *right* in the dorsal region, and reference to *Fig.* 66 C will help considerably in its interpretation. Starting from the hands-and-knees position, the left knee is first moved forwards, and the right leg is then stretched backward and swung across to the left as far as it will go. The result is to side-tilt the pelvis in such a fashion as to unfold the lumbar curve. The left arm is then advanced and the trunk strongly bent to the right. This movement unfolds the dorsal curve. Thus the total effect is to correct the deformity by reversing both curves by movements which, in a normal spine, would produce a double curvature convex to the *left* in the dorsal region.

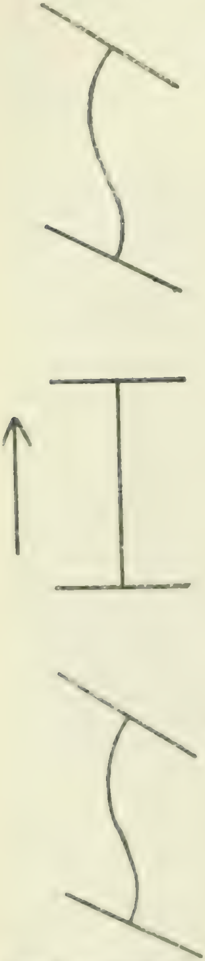


Fig. 67.—Diagram of the low-creeping exercise.

The patient makes both phases of the movement very strenuously, the pelvis being side tilted to the right, and the shoulder girdle turned to the same direction, as much as possible, and this position is maintained for a few seconds. The next pace forwards is a simple one, and is made by advancing the right knee and right hand without any crossing of the legs or much curving of the trunk, its object being merely to relax the tension on the spine for the time being and to bring the patient into position to repeat the stronger corrective movement. *Fig.* 68 shows in diagram the progression of the patient. In dealing with a case of double curvature convex to the *left* in the dorsal region, the sides of the strong and weak movements in the above description would, of course, be reversed.

This exercise is a difficult one, and the patient requires some practice in Nos. I and II before proceeding to it. When carried out to perfection, the front part of the body travels along quite close to the ground, with the arms spread out and elbows up, much in the same style that a crocodile's body is carried along between its own forelegs.

The exercises may be carried out in a room, corridor, or any place, in short, with a smooth floor free from splinters. The patient is provided with a loose gymnasium costume, the knees are protected by knee caps of thick boiler felt tied on with tapes, and the hands may be similarly protected by a pad of felt worn on the palmar aspect. Gymnasium shoes, the toes of which may be strengthened up against friction by a cap of leather, complete the outfit.

Patients who are undergoing treatment, exercise for one hour in the morning, and for any time up to one hour in the afternoon. Forty minutes of this hour are devoted to the *creeping* exercises, the greater part of the time being occupied by No. I, and the remainder by an occasional few minutes of No. II, and also of No. III, when the case is such as to demand it. A brief rest is taken at suitable intervals, the patient lying prone on the floor and resting the chin on the folded hands. Such a position of rest (*Plate XLVIII, Fig. B*) is valuable for most spinal cases, especially for those with a tendency to kyphosis, and is the position adopted for at least half an hour at the end of each exercise period. Reading, and some other light pursuits, may be practised if a cushion be placed under the arms.

The latter portion of the hour is devoted to "straight work" exercise calculated to act more directly upon the spinal muscle groups. These are considered below. As the patient improves, and the thoracic framework grows more flexible, and more capable of being held in correct position, this "straight work" becomes the more important part of the programme, and a greater proportion of time is allotted to it.

In early cases, where there is no fixed distortion of the thoracic framework, the straight exercises are the more important from the beginning, but the creeping method—chiefly Exercise No. I, with equal movements on the two sides, i.e., "symmetrical creeping"—is highly advisable at first, in order to strengthen up the muscles by gentle means, and so prepare them for the more strenuous efforts which follow.

Before discussing the latter, it will be well to point out some of the advantages which may be claimed for the system of exercises already described:—

1. In the all-fours position the spine is relieved of weight, and is automatically straightened out as much as possible. The general rule in these cases, that all exercises should be performed with the spine in the best possible position, is thus obeyed. *Fig.* 69 shows a record of the spine of an overgrown youth, 17 years of age, whose trouble is due to a left leg three-quarters of an inch shorter than the right, and to a year's close desk-work. On the left is the chart of his spine in the erect position, the vertical measurements being taken by calipers from a base-line drawn through the posterior superior iliac spines. On the right is a tracing obtained from him on all-fours, by placing a dot of printer's ink on the tip of each spinous process, and taking a transfer on a strip of linen. The spine is shown to be straightened out, and incidentally the production of his triple curve from a single left convex curve is analyzed.

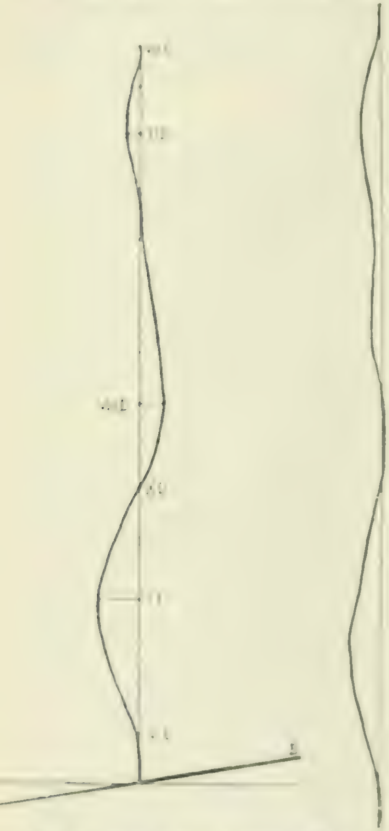


Fig. 69.—Spine in erect position on left, with the tracing on all-fours on right.

2. The movements are kept within the limits of the physiological excursion of the parts; there is no acrobatic distortion. The muscles on both sides of the spine are dealt with—those on the convexity of the curve which, hypertrophied at first by their efforts to restore the spinal balance, finally become stretched and weakened—as well as those on the concavity of the curve, which become contracted.

3. The exercise is not severe, and patients soon find themselves able to keep it up for full time without fatigue or muscle-soreness. The morbid curves are thus unfolded some two hundred times, or more, at each session, and entirely by the patient's own muscular efforts. In both respects the great superiority over the methods of treatment by pulling by hands or by bending the patient by manual help, either with or without some supporting apparatus, is evident.

PLATE XLVII.

SCOLIOSIS—[illegible]

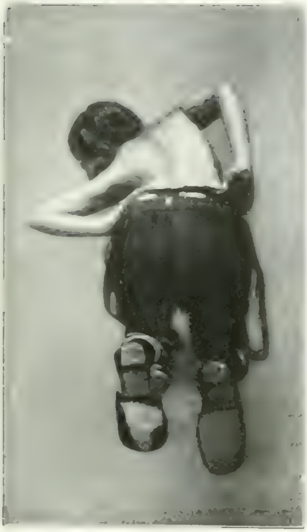


Fig. A.—Movement to the left in Exercise II.

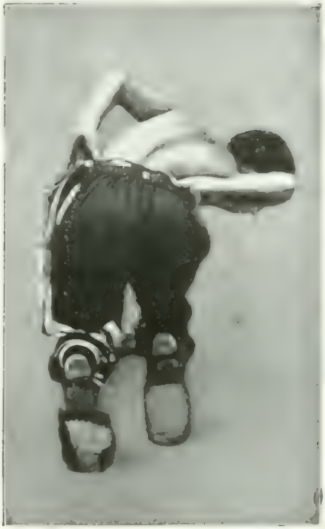


Fig. B.—Movement to the right in Exercise II.

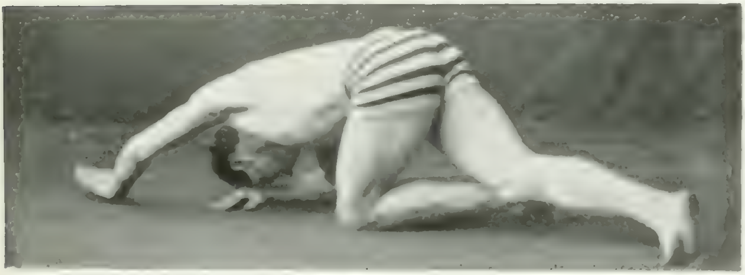


Fig. C.—The low creeping movement employed chiefly in double curves with marked kyphosis.

PLATE XLVIII

[illegible]

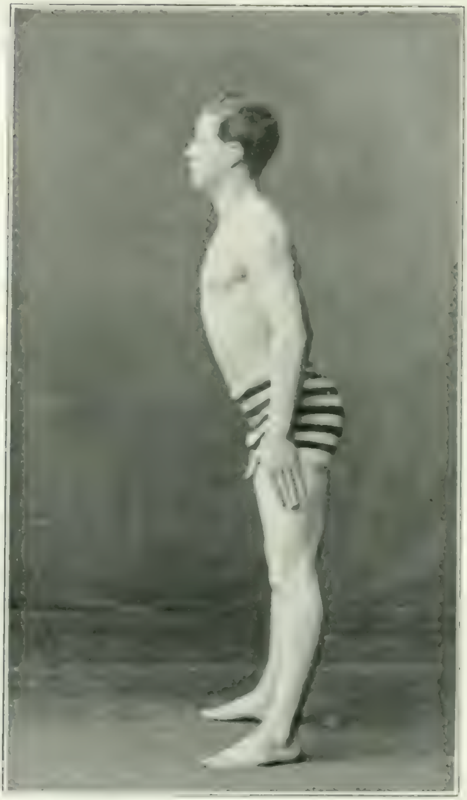


Fig. 1.—The starting position for [illegible]

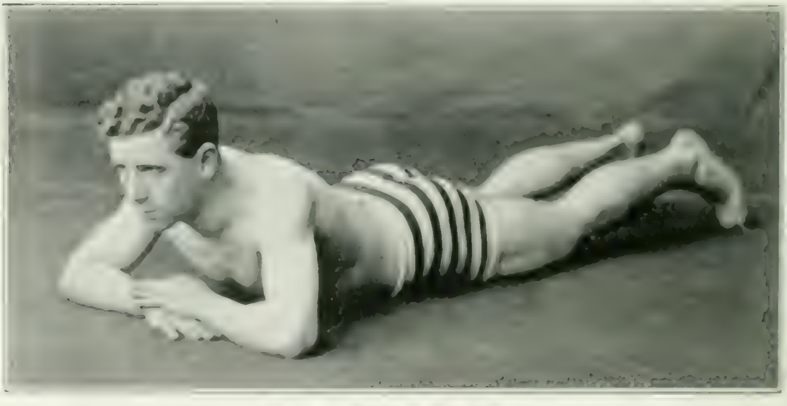


Fig. 2.—The position of rest.

PLATE XLIX.

SCOLIOSIS—*continued.*

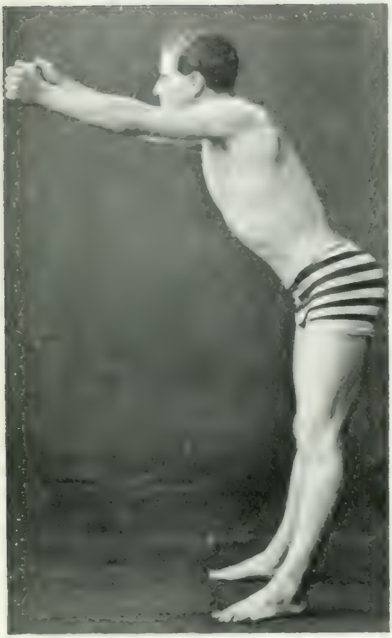


Fig. A.—Fists forward in Exercise No. II.

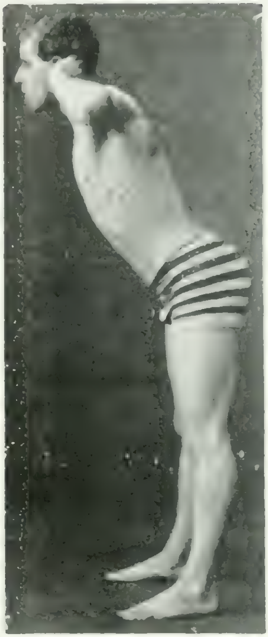


Fig. B.—Bending forward in Exercise No. III.

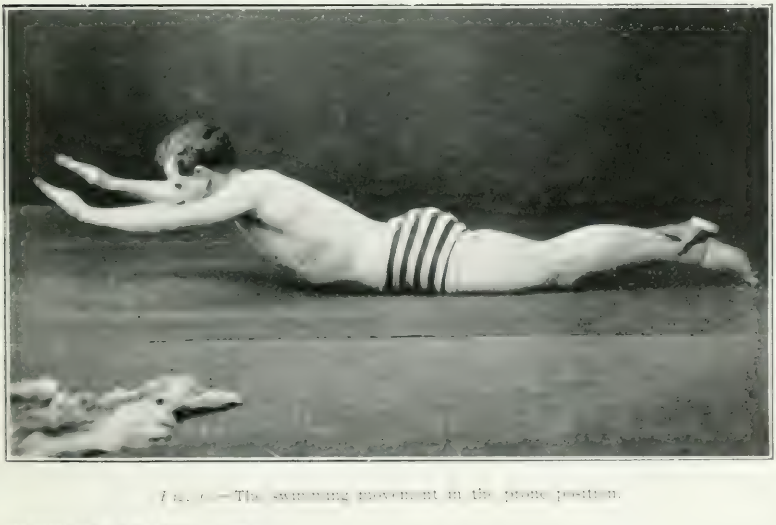


Fig. C.—The swimming movement in the prone position.

PLATE [illegible]

SCOLIOSIS—[illegible]

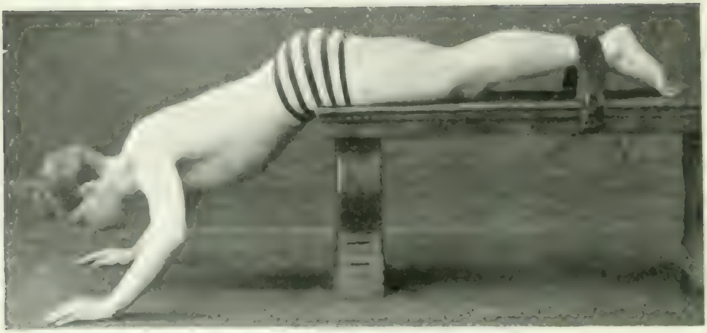


Fig. 1.—The resting position on the bench.

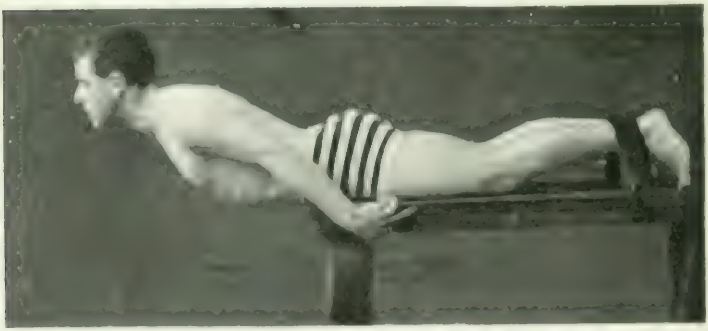


Fig. 2.—The starting position of Exercise No. I on the bench.

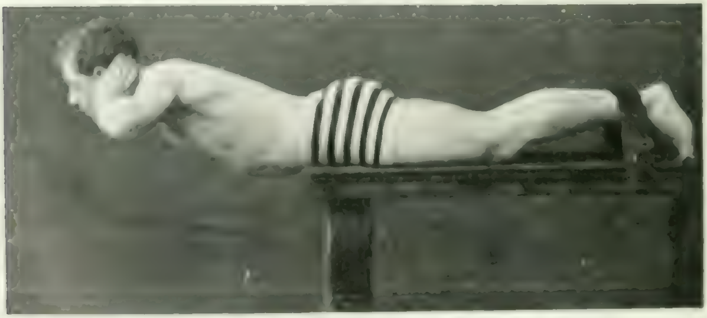


Fig. 3.—The starting position of Exercise No. III on the bench.

4. It is efficacious: the spine is acted upon at both ends: and it is sometimes capable of producing extraordinary improvement in the most unpromising cases. *Fig.* 70 shows the tracings from a much-deformed adult of twenty-six years, with a progressive downward history, despite the use of mechanical supports, of ten years. The tracings are of the "sky-line" of the back at the level of the sixth dorsal spine, and are taken with a wax strip with the patient in the usual position, i.e., bending forwards with the trunk at right angles to the legs and with the arms hanging loosely down. They are taken in each case between points on either side of the spine which occupy the same horizontal plane, and therefore give a true picture of the contour of the posterior part of the thorax. The continuous line shows the condition at the commencement of treatment, the interrupted line the improvement in four months. In such an advanced case a cure was out of the question, but the exercises were quite successful in relieving constant aching pain and in restoring the patient, with the help of a light supporting apparatus, to a life of healthy activity.

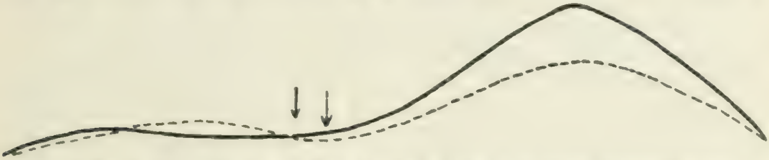


Fig. 70. Tracings of contour of the "sky-line" of back in advanced scoliosis—patient aged 26. Dotted line shows improvement in four months.

"STRAIGHT WORK" EXERCISES.

The object of the second series of curative exercises ("*straight work*" series) is, as before said, to strengthen up the spinal muscles to such a degree that they are capable of maintaining the improved position rendered possible by the first series. The movements about to be described do not belong to any one particular system, and are selected for their simplicity and the efficacy of their action upon the spinal muscle-groups. They are carried out in four positions—standing, sitting, prone on the floor, or on a bench—but they have all the same root idea, viz., *the spine being stiffly held, the trunk is* (1) *Either made to perform movements of flexion and extension at the hip joints whilst the arms are kept still* (*I, III, V*); *or* (2) *Is held in the position of strain* (*i.e., flexed on the hips when sitting or standing, extended if prone*) *whilst the arms are active* (*II, IV, VI*). The standing and sitting positions are especially valuable in cases where the patients are very deficient in the proper sense of muscle balance. As a general rule, the prone positions are the most useful, and that on the floor is the easiest for the beginner to learn.

In all the exercises the spine *must* be stiffly held, so that the lumbar curve becomes as pronounced as possible and the erector spinæ muscles feel hard to the touch all the time the patient is working. Whatever position is taken up, the programme is just the same as regards details of movements, which may be listed as follows:—

No.	Trunk	Arms
I	*Flexion and extension	By sides
II	Flexed, if standing or sitting Extended, if prone	Fists to shoulders Shoot fists forwards Recover
III	Flexion and extension	Hands to back of ears
IV	Flexed, if standing or sitting Extended, if prone	Fists to shoulders Shoot fists outwards Recover
V	Flexion and extension.	Stretched above head
VI	Flexed, if standing or sitting Extended, if prone	Swimming movements (breast stroke)

*[illegible]

Each exercise is carried out six to twelve times, and a series in one vertical and one prone position—e.g. standing and on the ground, or sitting and on the bench—is gone through at each session. A rest of a few moments is given after each exercise. There must be no hurrying, and each phase of an exercise must be marked by a slight pause. This is insured by the instructor giving words of command for the slower movements, and counting the quicker movements in seconds time. For example, No. II in standing position would be conducted thus:—

Instructor		Patient
Attention		Assumes starting position (Plate XXVIII, Fig. 3)
Forwards bend		Trunk forwards
Prepare		Fists to shoulders
In seconds time	One	Fists shoot forwards (Plate XXX,
Repeat movement	Two	Fists back to shoulders Fig. 1)
six times	One	Fists shoot forwards
	Two	Fists back to shoulders
As you were		Patient drops hands and stands erect

Again, No. III on the bench would be as follows:—

Instructor		Patient
Attention		Rises from the resting position (Plate I, Fig. 4), and at once assumes the position of exercise (Plate I, Fig. 1)
Repeat	Downwards	Trunk is flexed at hip joints
movement	Upwards	Trunk recovers
six times	Downwards	Trunk is flexed at hip joints
	Upwards	Trunk recovers
As you were		Patient resumes attitude of Plate I, Fig. 4

In the swimming movements (No. VI) the instructor times the quick forward dart of the hands and allows a suitable period for the deliberate backward sweep. Respiration must be carefully trained in this movement. Inspiration is made through the nostrils, with closed mouth, as the arms go backwards. Expiration is made forcibly and audibly with the mouth open as the arms shoot forwards.

It now remains to note briefly certain details of each position :—

1. *Standing.*—*Plate XLVIII, Fig. A*, gives the starting position. The feet are apart, knees quite stiff, trunk inclined slightly forwards with the back well arched, arms by the side, shoulders down, head erect. In Exercises I, III, and V, the trunk bends forwards and backwards from this position with the arms by the side, to the back of the ears, or stretched above the head, as the case may be. *Plate XLIX, Fig. B*, illustrates No. III, and shows the patient during the act of bending forwards. Notice that the knees are rigid, the back is well arched, and the erector spinæ thrown into prominence. In Exercises II, IV, and VI, the arm movements are made with the trunk held inclined forwards. *Plate XLIX, Fig. A*, illustrates No. II. Notice again, that the knees are rigid and the body well arched.

2. *Sitting.*—The patient sits forward on the edge of a chair or stool, with the feet on the floor and the back held stiff. The movements are made exactly like those in the standing position, but in Exercise I, with the arms down, the hands grip the edge of the front or sides of the seat.

3. *Prone on the Ground.*—The patient lies on a rug, and the feet are kept down by a strap or by the instructor's hands. In Exercises I, III, and V, the trunk movements are necessarily confined to a " rearing up " from, and a return to, the prone. This is done with the arms in their appropriate positions—by the sides, with the hands to the back of the ears, or stretched forwards to fullest extent, as the case may be. In Exercises II, IV, and VI, the trunk is held as in *Plate XLIX, Fig. C*, which illustrates the swimming movement.

4. *On the Bench.*—The bench should be about 20 inches high. The patient lies prone with the pelvis at the edge thereof, and the feet are kept down by a strap passing over the ankles. *Plate L, Fig. A*, shows the resting position which the patient assumes between the exercises, and from which the starting position of any particular exercise is taken up upon the word of command. *Plate L, Figs. B and C*, illustrate the starting positions of Exercises I and III, and from these positions the trunk, held stiffly all the time, is bent from the hips towards the ground as far as possible, and then restored. In Exercises II, IV and VI, the trunk is maintained in position similar to that shown in *Plate L, Figs. B and C*, whilst the arm movements are carried out.

Personal Supervision.—It would seem superfluous to insist upon the necessity for this, were it not for the fact that the treatment of cases of lateral curvature by exercises is too often delivered entirely into the hands of certificated medical gymnasts, whose results, owing to their inelastic methods, are largely a matter of chance.

Any therapeutic measure is valuable in proportion to its range of application and its exact adaptation to a particular case; and this is just as true of the use of exercises in spinal deformities as it is of the use of a powerful alkaloid, or a vaccine, or the surgeon's knife, in other maladies. It is necessary to take into account the fact that lateral curvature occurs, as a rule, in what we may call a complex patient, and that surgeon will have the best results who submits each case to the most careful analysis, and who gives the strictest personal supervision to whatever method of treatment he may adopt.

In many cases, the ideal method is to place the patient at a school where the malady is understood. The atmosphere of discipline is good, school-work and rest can be duly proportioned, and the presence of other pupils undergoing treatment stimulates interest and avoids monotony. A nurse trained in one's own procedure pays daily visits and superintends each period of exercise, but the surgeon directs the whole conduct of the case; he initiates every new movement, and sees that it is carried out properly, and he prescribes all such accessory measures as may be necessary. The dominant factor of the patient's life is the cure of the spinal deformity, and everything must be subservient to this.

The management of the exercises has already been described. It may be added that the patient, who is generally a weakly girl, cannot be expected to take the full time to begin with, but with the system advocated here, the capacity to do so is soon gained. At first, not only the physical but also the mental processes become fatigued, and a short cycle of exercises carried out with full intent is worth many hours of perfunctory movements. It is better, as a matter of training, to occupy the full hour, interrupting the exercises with occasional rests, than to shorten the total time occupied. The surgeon must regard the exercises as a therapeutic remedy, and must beware of an overdose. Overworked muscle becomes as feeble as diseased muscle, and should the condition of "staleness" arise, the patient must be given a holiday for a few days.

Attention may now be drawn to the following points, which will serve also to indicate the type of discipline necessary. The maintenance of general health is of prime importance. Slight anæmia, not always obvious, is a frequent cause of muscular feebleness. In many cases of malnutrition, oil (cod-liver or petroleum) is helpful from the fact that it is second only to the natural HCl itself (often deficient in such cases) in producing secretin, and thus stimulating intestinal digestion. "The improvement of the scoliosis almost invariably results in improvement of the general health" (Forbes). Writing and reading at an ordinary desk, piano and violin playing, and all occupations involving strain and encouraging faulty attitudes, must be forbidden. Any "brain fag" is to be avoided, but easy studies may be carried out in the resting position, or at an adjustable desk of the [illegible] type. All attention should be given to the abdominal region. Other gymnastic exercises are not to be taken, but the daily walks and attendances at meals should be used as drills in training the patient to a sense of upright carriage. Towards the latter end of the treatment the second exercise hour may be occupied by singing or by swimming, and cycling may be allowed as an outdoor exercise. The spine must be relieved of weight as much as possible. Therefore bed must play an important part in the patient's life: ten to twelve hours are not too much. The patient should lie on the back, or on the side of the dorsal concavity.

REFERENCES.—[1]*N.Y. Med. Jour.* 1913, i; [2]E. Gillespie, *Clin. Jour.* 1913, 63; [3]*The Child,* 1913, Feb.; [4]*Trans. Amer. Orthop. Assoc.* 1913, May; [5]*Jour. Sci. Phys. Training,* No. 12; [6]Kellett Smith, "Lateral Curvature," John Wright & Sons Ltd., Bristol; *Brit. Med. Jour.* 1912, ii, 1400; *The Child,* 1913, Apr.; [7]"Funktionelle Behandlung der Skoliose," Fischer, Jena.

SPINE, OSTEOMYELITIS OF.

Priestley Leech, M.D., F.R.C.S.

Strong[1] reports eight cases of this disease, which is rare, but not, he thinks, so rare as is generally believed. The actual cause is the *Staphylococcus aureus*; a history of injury is common; a whitlow has also been the cause.

DIAGNOSIS.—The disease may and often does closely resemble Pott's disease, especially if it runs a subacute or chronic course. Kirmisson mentions the following points of distinction: the abscess of Pott's disease most often appears externally in Petit's triangle, and is roundish, whereas that of osteomyelitis spreads along the vertebral column and is fusiform or oblong. Especially important are evidences of secondary circulation in the skin round the abscess, owing to septic thrombosis in the spinal veins.

TREATMENT.—Immediate operation offers the best prospect of cure, but opinions differ as to the details. Some advise opening of the abscesses and removal of the necrosed bone, while others advise wiping out with carbolic acid, neutralizing with alcohol, and leaving the bone alone.

REFERENCE.—[1]*Lancet,* 1912, ii, 1570.

SPIROCHÆTOSIS.

Leonard Rogers, M.D., F.R.C.P.

G. H. F. Nuttall,[1] discussing our present knowledge of this class of diseases, begins with a description of the *Spirochæta anserina* of geese and fowls, and its transmission through the bites of a tick, the *Argas persicus,* which is most infective if kept at a temperature of 30° to 35° C. after feeding on a diseased bird. The spirochætes enter the cœlomic cavity and reach the Malpighian tubes, where they form numerous coccoid bodies, as well as in the lumen of the gut and in the coxal gland. In the act of feeding, the tick often exudes excrement and secretion of the coxal glands, and the infection may thus reach the wound made by its bite and produce infection. From the Malpighian tubes the coccoid bodies pass to the eggs and infect the next generation, by whom the disease may be transmitted.

In the case of human relapsing fever, Livingstone in 1857 was the first to report that the disease is transmitted by the bites of a tick now known as the *Ornithodorus moubata*; in 1905, Dutton and Todd, and soon afterwards Koch proved the correctness of this observation, and demonstrated that the offspring of infected ticks also conveyed the disease. From 5 to 15, and at times 50 per cent of ticks may harbour the parasite, especially along caravan routes in rest-houses, which are frequent sources of infection. As the tick is known to be much more widely distributed in Africa than the fever there is reason to fear extensions of the latter with opening up of trade routes. The fever has been frequently transmitted by ticks to rats, mice, and monkeys, and accidentally to workers in European laboratories. Moller infected ten out of twelve successive monkeys on which one lot of ticks had fed, 50 per cent of these animals dying of the disease. A tick has been proved to convey the disease eighteen months after its first infective meal of blood. Some ticks acquire immunity to infection. Leishman was the first to prove the infection through the excreta and coxal secretion in this form of spirochætosis and traced the infection of the eggs through the Malpighian tubes. A number of strains of spirochætes of relapsing fever of different origin have been described; but it is doubtful how many of them are distinct species and *O. moubata* has been found capable of harbouring the infection of several of them.

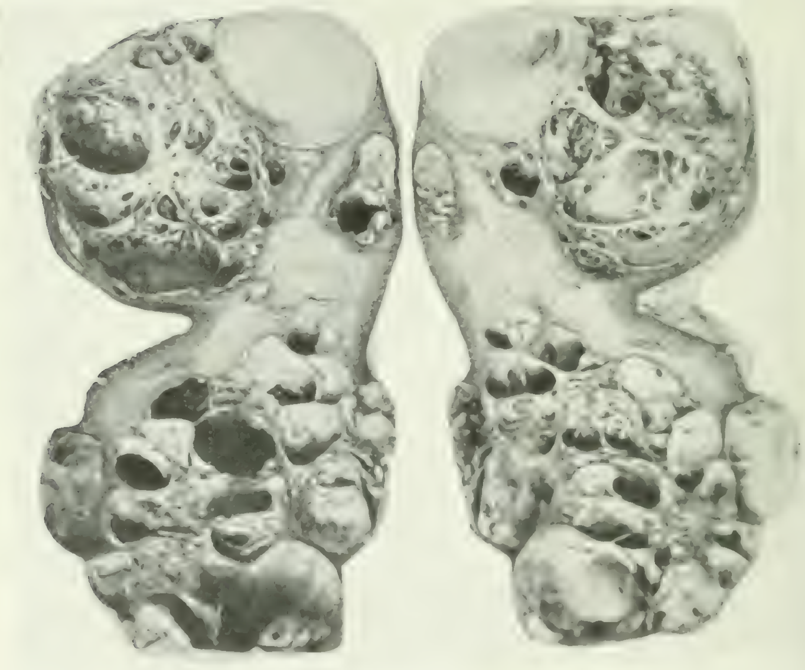
Other insects besides the tick have been shown to transmit spirochætosis. Thus, in 1897 Tictin infected monkeys with the contents of bugs twenty-four hours after a feed on relapsing-fever blood; and in 1902 the spirillum was found to survive as long as thirty days in bugs. In 1907 Mackie proved that lice could transmit relapsing fever of Bombay, and traced the organisms to the gut, ovary, testis, and Malpighian tubes of the insects. A year later Sergent and Foley found lice carrying the infection of relapsing fever in North Africa; and in 1912 Nicolle showed that the organisms disappear from the gut of lice after twenty-four hours to reappear after about eight to twelve days, when their body contents smeared on excoriations of the skin produced infection. They also proved that the eggs and offspring of lice may be infected so that lice crushed on the person during scratching might infect human beings.

H. Noguchi[2] records the successful cultivation of several varieties of spirochætes of relapsing fever by the same method that he employed for the *T. pallidum*. A piece of fresh tissue, such as rabbit kidney, is placed in a sterile test tube, a few drops of the citrated blood from the heart of an infected mouse or rat are added, and about 15 c.c. of sterile ascitic or hydrocele fluid poured in. The tubes are incubated at 37° C., with or without a layer of sterile paraffin oil on the surface of the fluid. Subcultures have been obtained, in one case up to twenty-nine passages, by transferring half a cubic centimetre of the first tube, preferably with the addition of a little normal rat's blood. On examining the living cultures with the aid of dark-ground illumination, he observed longitudinal division in every case, while the more usual transverse division was rarely seen.

G. V. Browse[3] describes what he takes to be a special form of relapsing fever met with at Quetta, on the north-west frontier of India. In its

PLATE II.

EXTENSIVE MULTILOCULAR CYST FORMATIONS
IN THE SPLEEN.



[illegible]

course and blood changes it resembles the African more closely than the European variety, but occurs in a very different climate. During a year's observations, the spirillum was found in eighteen cases, which seemed to follow five to ten days after warm spells of weather. The cases were almost confined to overcrowded followers' quarters, but were irregularly distributed in them. The disease was mild, onset sudden, febrile paroxysms short, two to three days at first, decreasing to a few hours in later relapses, which numbered from one to six, giving very irregular temperature charts. The blood counts were made by Rogers' method, and showed but slightly marked total and relative polynuclear increase, together with some large mononuclear excess, although antecedent malaria did not appear to be its cause, thus differing from the typical changes of relapsing fever other than the African form. Both lice and bugs were present, also a tick said to be *O. tholozani*, and one *Argas persicus* was found, but he was unable to ascertain which was the carrier of the infection. He found the thick-drop method very useful in detecting the spirochætes when they were scanty. Frequently found during the apyrexial intervals, they did not differ in appearance from the usual descriptions. A. M. Jukes[4] describes a somewhat similar type of spirillum fever in the Darjeeling hills, but which was very fatal.

REFERENCES.—[1] *Johns Hop. Hosp. Bull.* 1913, 33; [2] *Münch. med. Woch.* 1912, 1937; [3] *Ind. Med. Gaz.* 1913, 387; [4] *Ibid.* 222.

SPLEEN, CYSTS OF.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

ETIOLOGY.—Cysts of the spleen may be classified as dermoid, parasitic, and non-parasitic. There is only one recorded case of the first. Echinococcus is the most frequent variety of parasitic cyst, and occurs in regions where hydatid disease prevails. In about half the recorded cases the spleen was the only organ affected.

Fowler's article[1] is chiefly devoted to a study of the non-parasitic cysts. He rejects the usual subdivisions of hæmorrhagic, serous, and lymphatic cysts, and suggests a classification which will indicate the mode of origin of the cyst: (1) Traumatic (hæmatoma, secondary serous cysts); (2) Infoliation (traumatic or inflammatory inclusions of peritoneum); (3) Dilation cysts (ectasis of splenic sinuses); (4) Disintegrative (infarction, etc.); (5) Neoplastic; (6) Degenerative cysts (arising from secondary changes in new growths). Most of the cases occurred in middle life, and in six cases there seemed to be some relation between pregnancy and cyst formation. Three of these were blood-cysts, and Fowler suggests that they were possibly due to secondary hæmorrhage in an infarct. The common factor in the etiology of cysts of the spleen is trauma. The extensive multilocular cyst formations in the spleen are of considerable interest. Such a one is figured by Fowler (*Plate LI*), who explains the condition as a dilatation of lymph or blood sinuses.

SYMPTOMS.—The principal are pain, pressure phenomena, and tumour. Pain, in the left hypochondrium, is of a heavy dragging character, closely resembling that commonly attributed to a movable kidney. In other cases pain may be absent, or it may occur in repeated attacks, probably due to peritoneal reaction. Pressure symptoms take the form of digestive disorders, and are probably due to displacement of the stomach and intestine. An elastic tumour may be palpable to the left of the umbilicus.

TREATMENT.—If not contraindicated by the presence of extensive adhesions, **Splenectomy** is the operation of choice. If this is impracticable and the cyst is subcapsular, its wall may be excised and its floor destroyed by cautery.

Resection of a portion of the spleen bearing the cyst is rarely justifiable, as these cysts are rarely pedunculated, and the danger from hæmorrhage is great. Incision and drainage or marsupialization are better suited to the treatment of parasitic cysts, when more radical methods are not feasible.

REFERENCE.—[1]*Ann. Surg.* 1913, i, 658.

SPLENOMEGALY. (*See also* POLYCYTHÆMIA; SPLEEN, SURGERY OF.)

Herbert French, M.D., F.R.C.P.

Splenic anæmia may or may not be a clinical entity; it is at any rate an ill-defined disease, for many cases that are thought at one period or another to be typical examples, ultimately turn out to have been some commoner malady—especially cirrhosis of the liver—in a stage at which splenomegaly and anæmia attracted main attention, the other and more usual symptoms not appearing until after the lapse of months or years. There are many, however, who believe splenic anæmia to be a real disease, recognizable by its clinical symptoms; and there is increasing evidence to show that **Excision of the Spleen** is beneficial, or even actually curative, to the patient. The clinical features presented by 18 cases in which this procedure was adopted have been summarized by Giffin[1]; 12 of the patients were females and 6 males; the youngest was twenty-two, and the oldest fifty-six. The average age was thirty-seven.

Enlargement of the spleen was noted in one case twenty years before operation; in another fifteen; in a third ten years. In 8 instances splenic enlargement had been noted less than a year preceding operation, and in the remaining 7 from one to seven years. It is probable, however, that splenomegaly had in reality been present for a longer time in many of these cases. In 14 the enlargement of the spleen had definitely preceded the appearance of anæmia. In no case did the occurrence of anæmia clearly precede splenomegaly. The recorded measurements of all the spleens show them to be either large or enormous. All save one, which lay transversely, reached below the level of the navel, and 7 extended into the left iliac fossa and beyond the median line. In none did the long axis extend diagonally across the abdomen, but lay almost entirely to the left of the median line. It is interesting to note that one spleen lay very high, and the enlargement extended transversely into the epigastrium, only one-eighth of the spleen being palpable below the costal margin.

The anæmia was of the secondary type, and there was an absence of leucocytosis. Differential counts were not distinctly abnormal. Hematemesis occurred in five cases; in four of these it was severe. In one case it had occurred every year for fifteen years. Blood in the motions was also present at these times. In one case of Banti's disease, in which hematemesis had been severe for nine months, the hæmoglobin dropped as low as 20 per cent. This patient was still well three and a half years following the operation. There was no instance of bleeding elsewhere than from the gastro-intestinal tract.

The frequent occurrence of pain in the region of the spleen is noteworthy; it is probably caused by the perisplenitis which is so commonly present. Infarction may also be a cause of pain. Fever was present in only two of the cases while under observation, and was not over 100°. Two patients presented conditions simulating splenic anæmia, and suffered from high fever, chills, and prostration in periodic attacks; but one of them at exploratory operation showed an advanced cirrhosis of the liver; the other had splenectomy performed, but at operation evidences of gall-bladder disease were found, with many upper abdominal adhesions, and the spleen was not of enormous size. In this patient there were periodic and abrupt elevations of temperature to 105°, and at the same time the size of the spleen increased and upper abdominal pain of moderate severity was complained of. The condition of the spleen seemed to be secondary to a widespread abdominal infection, and not primary.

Diarrhœa had been present in only four cases. A history of malaria was obtained in only four cases, in two of which there may have existed some direct etiological relationship. It is probable that chronic malaria produces a condition which eventually cannot be differentiated clinically from splenic anæmia. A history of lues was not obtained in any of the cases. The Wassermann reaction was done on several of the more recent cases, and was negative.

Cirrhosis of the liver was diagnosed at operation in five cases. In one additional patient, clinical evidence of cirrhosis of the liver developed a year after, and the patient died later. No case showed abdominal fluid without evidence of change in the liver at operation. Jaundice was noted during the course of the disease twice, once with and once without evidences of cirrhosis.

Death followed splenectomy twice; of the 16 patients who recovered from operation, 12 were in excellent health at the time of reporting after periods varying from six months to seven years; 2 were improved; 1 improved for several months, but later developed ascites and died three years after operation, with symptoms of hepatic cirrhosis; and 1 died two and a half years after operation—the cause of death unknown.

Eppinger[2] records ten cases of splenectomy which seem to throw some new light both upon the physiology of the spleen and upon the nature of certain hæmolytic diseases, especially hæmolytic jaundice and pernicious anæmia. He is, we think, the first to have treated *pernicious anæmia* by excising the spleen, and states that the results have been good.

He also suggests that in *cirrhosis of the liver* the spleen plays a much more active part in the production of the pathological changes than has hitherto been recognized; and that here also splenectomy is good treatment if the disease can be diagnosed in the early stages. Tansini and Morone[3] record a case of splenectomy in the ascitic stage of cirrhosis of the liver; the operation was undertaken in their patient on account of acute abdominal symptoms due to splenic thrombosis; the result was remarkable in that it led to apparent cure, or at any rate to the subsidence of all symptoms, in a patient suffering from cirrhosis of the liver that had reached the ascitic or last stage.

REFERENCES.—[1] *Amer. Jour. Med. Sci.* 1913, i, 781; [2] *Berl. klin. Woch.* 1913, 1572; [3] *Rev. de Chir.* 1913, ii, 293.

SPOROTRICHOSIS.

Herbert French, M.D., F.R.C.P.

Hamburger[1] discusses the incidence and clinical symptoms of sporotrichosis in man. He classifies the clinical varieties of the lesions as follows: (1) *Localized sporotrichosis*, with sporotrichotic chancre and ascending lymphangitis and local lymphadenitis. (2) *Disseminated gummatous sporotrichosis*; multiple subcutaneous nodules distributed without systematic arrangement throughout the body; early small, hard, painless, round masses; late small and large soft cold abscesses; no ulceration. (3) *Disseminated ulcerative sporotrichosis*; multiple polymorphic ulcerations of the nature of tuberculous, syphilitic, ecthymatous, rupial, or furuncular lesions, or a mixture of these. (4) *Extracutaneous sporotrichosis*, with localization in mucous membranes, muscles, bones, joints, ocular tissues, synovial membranes, kidneys, and lungs.

Sporotrichosis may affect voluntary muscles in two ways (Moure and Bautle[2]): (1) By direct extension from the skin or subcutaneous tissues; (2) As a primary condition; the latter may affect only a single muscle, the triceps for example, and the diagnosis may be difficult. The mass passes through the three stages of tumour, softening, and suppuration, and it is apt to suggest in succession fibroma, gumma, and tuberculous cold abscess. The diagnosis can only be made by careful bacteriological investigations. Moure and Bautle record a case in point in which surgical measures were adopted not only without success but with actual detriment, whereas cure was effected quickly on giving iodides. It is unfair to the patient to conclude that the condition is syphilitic because it heals under iodides; the Wassermann test should be carried out and found negative.

DIAGNOSIS.—Hamburger believes that the condition is by no means so uncommon as might be expected from the literature, many cases escaping diagnosis. He says the features which are helpful in the differential diagnosis of sporotrichosis may be grouped as follows:

PLATE LII.

SPOROTRICHOSIS

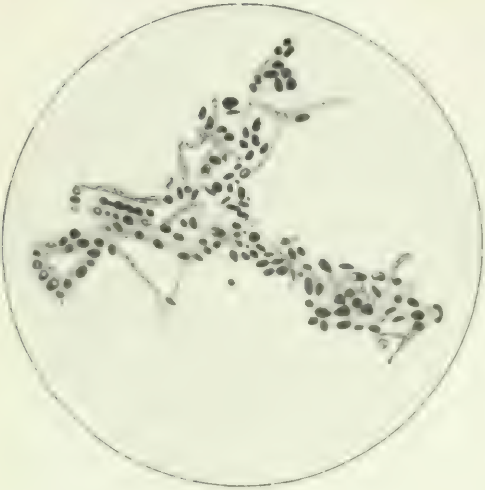


Fig A.

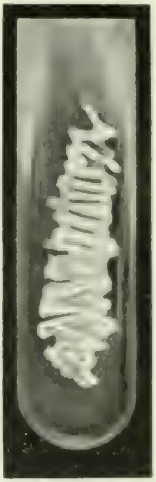


Fig B.

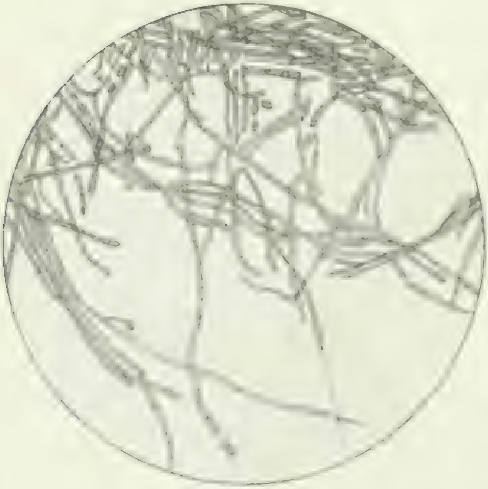


Fig. C.

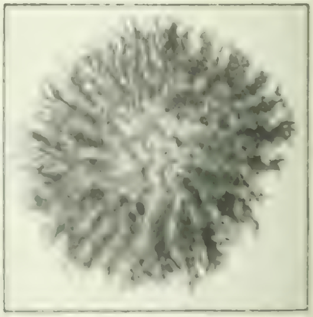


Fig. D.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

There is local and general eosinophilia. Eosinophils have been noted in the initial chancre in the nodules, in the pus from the broken-down nodules, and in the circulating blood. The cultivation of the organism on artificial mediums is of great diagnostic import, the growth of *Sporotrichum* being characterized by its slow initial appearance; its ready growth on 2 per cent glucose agar at room or incubator temperature; its raised corrugated appearance on slant agar, and its radiating, flower-like appearance in stab culture; its brownish-black pigment production in old cultures and on 4 per cent glucose agar; its branching septate mycelium and pear-shaped spores (*Plate LII*).

TREATMENT.—**Potassium Iodide** should be administered internally in increasing doses, as high as 6 grams a day and even more, and the local lesions should be dressed with a weak **Iodine-Iodide Solution** (water, 500 grams; potassium iodide, 10 grams; iodine, 1 gram). Finally, the ulcerated points should be cauterized with **Tincture of Iodine.** The prolongation of general treatment for a month after complete apparent recovery, is indispensable to prevent relapse and recurrences.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1912, ii. 1590; [2]*Presse Méd.* 1912, 902.

SPRUE.

Leonard Rogers, M.D., F.R.C.P.

A. Castellani[1] records three cases which were clinically sprue, even including the mouth lesions in one, but which on investigation proved to be associated with a Flexner-like bacillus, strongly agglutinated by the patient's blood. In one case a **Vaccine** of the organism was injected, apparently with good effect. **Milk Diet** and **Bael** and 5-gr. doses of **Ipecacuanha** were given with good results in two cases. He thinks the cases should be regarded as pseudo-sprue, as he has never seen true sprue recover in Colombo. [This is also the writer's experience in Calcutta.—L. R.]

G. C. Low[2] has studied the rôle of fungi in sprue, and found them present in seven out of eight cases, all belonging to the genus *Monilia*. He describes a new species isolated from the tongue of one of the patients. The sugar reactions of the different varieties found are recorded. They are present in largest numbers in very frothy stools, and decrease under large doses of sodium bicarbonate, probably owing to decrease of acidity. Similar fungi are found in other forms of diarrhœa and in some healthy individuals, so the writer concludes they are not the cause of the disease.

REFERENCES.—[1]*Jour. Trop. Med. and Hyg.* 1912, Nov. 337; [2]*Ibid.* 1913, Feb. [illegible]

SPUTUM. (See also TUBERCULOSIS, CLINICAL PATHOLOGY OF.)

Oskar C. Gruner, M.D.

A number of contributions on the subject of the *albumin reaction* have appeared during the year. The history of the test is given by Ritter[1] and by Ridge and Treadgold.[2] While the preponderance of findings is in the direction of the test being significant of tuberculosis, it is important to refer to a paper by Scott[3] who points out that a negative reaction may occur in about 10 per cent of pulmonary tuberculosis cases. For this reason it is probable that the practitioner should regard the test as, at most, of prognostic value rather than useful for initial diagnosis. Ridge and Treadgold found that albumin disappears from the sputum in cases of pulmonary tuberculosis that have progressed to complete cure. Continued absence of reaction, associated with continued absence of bacilli, means absence of active tuberculosis. Associated with the study of the cells in the fluid, the test becomes more valuable, because large mononuclear or alveolar cells are present, indicating the presence or absence of alveolitis in cases of chronic tuberculosis with emphysema.

Ritter said that a single negative albumin reaction was certain evidence that there was no tuberculosis, but Scott denies this. A positive reaction is of little value, since it may occur in any of a number of different diseases of the respiratory tract.

Stain for Cells in Sputum (Ridge and Treadgold).—A thin smear is fixed by dipping a slide into 1 per cent chromic acid for two seconds. Wash in tap water, and stain with Unna's polychrome methylene blue for three minutes. Rapidly differentiate with 90 per cent alcohol, wash and dry, and examine with an oil immersion at once. (Films do not keep.)

REFERENCES.—[1]*Med. Rev.*, 1913, i, 740; [2]*Lancet*, 1913, ii, 182; [3]*Jour. Amer. Med. Assoc.*, 1913, i, 446.

SQUINT. (*See* Ocular Muscles, Disorders of.)

STASIS, PERIPHERAL

Herbert French, M.D., F.R.C.P.

Goodhart[1] points out that there are many patients met with in general practice to whose malady it is difficult to give a scientific name, but who present evidence of stasis of the peripheral circulation without obvious organic disease. Such people have blue hands and feet, they get chilblains easily, the nose and ears may be red or blue, and associated with such surface appearances there are all sorts of abnormal cerebral sensations referable to similar peripheral stasis in the circulation in the brain; for the lack of a better term he designates the latter "blue brain." It is exceedingly common, and there are grouped around it a number of other conditions of which as yet pathological knowledge is indefinite; Raynaud's disease, angioneurotic œdema, and Milroy's hereditary trophœdema are probably of the same nature but more extreme in degree. "Blue brain" is perhaps a mild and distributed form of Raynaud's disease. It is found in males and females, adults, boys and girls; but it is much more common in females than in males. Cold blue extremities and dead fingers are its most common symptoms, and paroxysmalism is a usual feature. Amongst the other protean symptoms are included epistaxis, neuralgic periodic headaches, migraine, all sorts of feelings in the head, such as a sensation of weight or of cold, stupidity, woolliness, a far-away feeling, a dumb-like feel, giddiness, dizziness, depression, tinnitus, deafness, recurrent fainting attacks without obvious cause. Not a few cases become regarded as epileptic, and in some there is fear of grave cardiac disorder when the symptoms take the form of asthma, breathlessness, heart attacks and arrhythmia, puffiness and dropsy; and yet the subsequent course of the case shows that no grave malady was present. Some cases of acute alarming pulmonary flux are of a similar nature, and so also are others of rapid swelling of the tongue simulating acute glossitis. Goodhart remarks that fainting attacks, if recurrent, seldom indicate heart disease, but much more often peripheral stasis; though they cause alarm, they rarely indicate a grave prognosis.

Reference.—[1] *Pract.* 1913, i, 777.

STOMACH, CARCINOMA OF. (*See also* Stomach and Duodenum, Surgery of.)

Robert Hutchison, M.D., F.R.C.P.

Langwill[1] has made a careful statistical study of 200 cases of gastric carcinoma from the clinic of Professor Caird at the Edinburgh Infirmary, and concludes that gastric cancer is probably the commonest form of malignant growth occurring in males. Perhaps, with the exception of the uterus and breast, it is also the most common form of malignant growth in females, who are far more frequently affected than textbooks would lead one to imagine. It is not so much a disease of middle age as one would be led to believe, a marked percentage of cases occurring under forty. The prevalence of the belief that it is a disease of middle age has often led to disastrous results in the diagnosis of the disease under forty. Heredity, in some cases, plays an important rôle in etiology. When present, it is usually markedly so. All cases of gastric ulcer, healed or unhealed, are potential carcinomata. (*See also* Gastric Ulcer.)

Alcohol, by acting as an irritant, may cause ulceration and, later, carcinoma, or it may cause carcinoma directly. Oral sepsis and carious teeth probably are important factors also. "Pyloric" carcinomata are more common than "gastric." As a rule, the former give more definite signs. They should accordingly be more easily diagnosed, and as they lend themselves more readily to excision, operative results should be brighter.

Gastric disturbance in a person over forty-five should always arouse suspicion and be considered seriously. Unless definite improvement occurs in three or four weeks under medical treatment, such cases should be dealt with surgically. Systematic weighing in all gastric cases should be more commonly practised, carcinoma being marked by a steady decrease in body weight. Anæmia being marked in most cases only towards the close, blood examination is probably useless as a help to early diagnosis; subnormal temperature also is probably a late occurrence. Constipation is a marked feature in practically every case. Anorexia as a symptom is of the greatest importance—especially if occurring in a person over forty-five previously healthy—all the more so if it be accompanied by a feeling of load or weight in the epigastrium after food, by eructations, water-brash, and heartburn.

Vomiting and hæmorrhage are often too late occurrences to be of value in diagnosis in the early stages. Pain is an almost invariable early symptom. Examination of test-meals should be more commonly performed. On the results obtained, however, reliance can be placed only in the late stages. Earlier, they may support a doubtful diagnosis. Careful abdominal examination is essential. It must be limitedly performed and frequently repeated.

The presence of a tumour above the umbilicus should be a signal for immediate action, provided the bowels have been cleared out and a splenic or hepatic origin excluded. Cases in the past have been sent to the surgeon much too late—a fact clearly brought out by the relatively small number in which a radical operation was possible.

The only cure at present is surgical, and the mere prolongation of life is possible only through surgical intervention. All cases of doubtful gastric disorder, therefore, should be submitted to a careful examination, first without, and later (if necessary) under a general anæsthetic. This applies both to chronic cases and to those in persons over forty-five with a previously clean gastric history. If, thereafter, doubt exists, the situation being clearly and definitely described to the patient and his friends, a surgeon should be consulted. With the surgeon eventually must the issue lie. Only by the collaboration of physician and surgeon will an early diagnosis be arrived at, and a consequent radical treatment be rendered possible.

Reference.—[1]*Edin. Med. Jour.* 1913, i, 222.

STOMACH AND DUODENUM, SURGERY OF.

Sir Berkeley Moynihan, M.S., F.R.C.S.
Harold Upcott, F.R.C.S.

Ulcer.—Morley[1] has constructed a diagram (*Fig.* 71) showing the site of perforation in seventy-one cases. There were only two on the posterior wall, one in the stomach, and one in the first part of the duodenum. The gastric ulcers are noticeably limited to the region of the lesser curvature; of the duodenal, the great majority were on the anterior wall close to the pylorus. He reports four interesting cases in which no gross perforation was found, though general peritonitis was present. Three of these died, and post-mortem examination failed to show any perforation, the base of the ulcer in each case being formed only by the serous coat.

The table showing the relation of mortality to the time between perforation and operation speaks for itself.

	0 to 12 hrs.	12 to 24 hrs.	24 to 48 hrs.	[illegible]
Lived ...	36	8	5	1
Died ...	2	11	1	3

Turner[2] thinks there are two types of duodenal ulcer; perforation is an accident almost peculiar to one type, while it is an accidental complication of the other. He does not believe it possible to tell when perforation is imminent. After a period of pain and shock there is a period of reaction, in which it may not be easy to realize that perforation has occurred; on this account, the history of the initial attack is of great importance.

The pros and cons of primary *gastro-enterostomy* find a place in all discussions of this subject. Turner points out that in favour of primary gastro-enterostomy is the fact that "kissing ulcers" are not uncommon; an acute perforating ulcer on the anterior wall may be secondary to a chronic ulcer on the posterior wall, and simple suture of the former will not cure the latter. Corner[3] estimates that about one-third of the cases are cured by suture only, and that in these a gastro-enterostomy done at the primary operation would have been unnecessary. At the same time he admits that many subjects of the perforation of a gastric ulcer are benefited by a gastro-enterostomy. This is especially true if the perforating ulcer is in the neighbourhood of the pylorus. He concludes that, as a rule, a secondary gastro-enterostomy, done when it is needed, is better than gastro-enterostomy done at the original operation, which may after all not be required. He points out that it is common for patients to have an attack of pain and dyspepsia, commencing a few months after the operation for closure of the perforation, which is generally cured completely by medical treatment; the latter should therefore be applied to anticipate such symptoms in every case of recovery from perforation of a gastric ulcer.

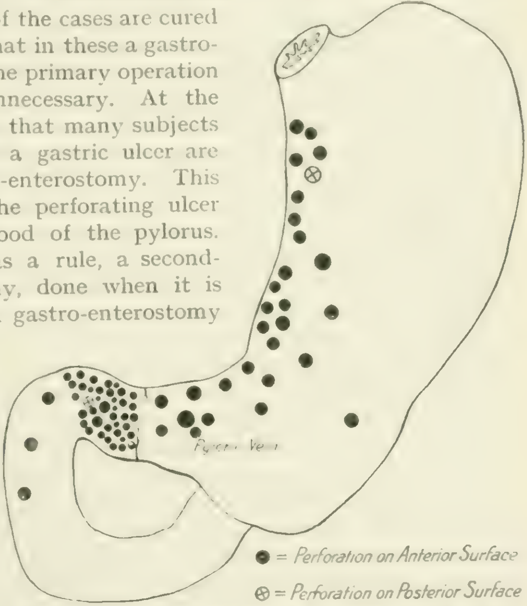

Pyloric Vein
● = Perforation on Anterior Surface
⊗ = Perforation on Posterior Surface

Fig. [illegible].—Diagram showing sites of perforation of gastric and duodenal ulcers in 71 cases.

It is well known that the œdema and friability of the tissues around a perforated ulcer often make its suture a matter of difficulty. Corner has shown that in such cases the perforation may be successfully tamponed and isolated with omentum or gauze; and he again draws attention to this method of treatment, which he holds should be adopted in all cases where suturing presents any difficulty. Neumann[4] gives his further experiences in the use of an *omental cuff* in the treatment of perforated ulcers of stomach and duodenum. His method consists in passing one end of a rubber tube through the perforation into the stomach or duodenum, and bringing the other end through the incision.

The intra-abdominal portion of the tube, which serves the double purpose of draining the stomach and providing a means for early feeding of the patient, is wrapped round with omentum.

He recommends this method specially in cases where the perforation is so near the pylorus that suture would cause obstruction; but the technique is so simple, and the after-course so smooth and safe that he thinks its use should be extended to other cases.

Cancer.—W. J. Mayo gives the experience gained from 1000 operations for carcinoma of stomach, of which 378 were resections, 246 were palliative operations, and 376 explorations.

The results of surgical treatment of gastric cancer compare favourably with the treatment of cancer in any other organ of the body, but it is most important that it should be carried out early. A clinical diagnosis of cancer of stomach cannot often be made early enough to obtain a radical cure by operation; but, as his figures show, in over one-third of the cases it was possible to make a diagnosis of some surgical condition, probably cancer, sufficiently early to permit resection of the growth. The aim of the diagnostician should be to suspect cancer rather than wait for a positive diagnosis. A suspicion of cancer is aroused by the presence of a palpable tumour, by evidences of food retention in the stomach (these two signs combined are pathognomonic of cancer in a case otherwise suspicious), by the deformities and muscular deficiencies shown by the x rays, and by an examination of the gastric contents. A suspicion of cancer is enough to justify early operation, which should always be commenced as an exploration.

According to Mayo, a patient submitted to exploration with a probable diagnosis of cancer of the stomach has a little over one chance in three that the operation will be radical, a little less than one chance in three that it will be palliative, and about one chance in three that it will be merely exploratory. The mortality among the 376 explorations, in which nothing further was done, was 1·6 per cent. If on exploration a resection is deemed possible, the portion of the stomach containing the tumour is drawn out of the wound for further inspection. It may be difficult to decide on a course of action when the stomach is mechanically removable, but enlarged and possibly infected lymph-nodes are found which are not removable. Mayo thinks that if such patients are in fair condition, and the operation presents no special difficulty, resection is justified, since it will probably give one or two years of comfortable existence. Palliative operations should not be performed except for the relief of mechanical obstruction, or when there is doubt as to whether the condition is due to ulcer or cancer. Gastrostomy may be required in the presence of cancer obstructing the cardiac end of the stomach, and jejunostomy is also occasionally of value.

Mitschell reports the results in 257 cases from Wölfler's clinic. Gastro-enterostomy was done in 193, with a mortality of 25 per cent, the average duration of life after operation being seven and three-quarter months. Resection was done 64 times, with a mortality of 40 per cent. Most of these deaths were from pulmonary complications.

Of the 38 patients who recovered from operation, 3 died later from other diseases without recurrence; 5 have remained cured for over five years. In the remainder, recurrence has taken place more or less rapidly, the average length after operation being thirteen months.

An important study of 157 **Resections** performed in Kuttner's clinic is that of Weil.[7] In the last five and a half years over 900 patients were treated for gastric affections in this clinic, with about 800 operations. Of these, 149 were typical gastric resections, 14 of them being done for callous ulcer, simple excision of which was not suitable treatment.

Resection was practised in such cases, only because it could not be decided whether the trouble was benign or malignant, and Weil emphasizes the fact that in a great number of cases one is not in a position to distinguish between them. There were 5 cases which seemed at the operation to be benign; but, doubting his ability to differentiate, Kuttner practised resection; histologically they proved to be carcinoma.

Among these 14 patients there were 3 deaths—1 from pneumonia, 1 from gangrene of lung, and 1 from hæmorrhage from further gastric ulceration, a proof that resection does not always protect against this misfortune.

Of the 135 resections for cancer of the stomach two-thirds were in men; over 50 per cent of the patients were under fifty. According to the duration of symptoms, the cases may be divided into two groups. In the larger, the trouble has existed only a short time, a few months, or at most one to two years. In a smaller group—about 25 per cent of the cases—the gastric symptoms were of several years' duration, from which one may conjecture that the cancer had developed upon an old-standing ulcer or hyperacidity. In by far the greater number, gastric pain was complained of; in only 10 per cent had the trouble developed painlessly. Vomiting was absent in only 20 per cent. Wasting was almost constant. In four-fifths of the resected cases, there was a palpable tumour or definite resistance in the upper abdomen. Weil stoutly combats the prevalent view that where there is a palpable tumour the radical operation will be impossible. On the contrary, the pyloric tumour which can be felt offers a good chance of resection.

The opposite view—that radical operation should only be performed in the presence of a palpable and mobile tumour—is also not to be relied upon. Resection was done in numerous cases where there was merely a doubtful resistance—generally a sign of growth of the lesser curvature. Weil does not think the *x*-rays are of much value in deciding as to the operability of cases; he has never seen an early diagnosis of gastric cancer made thus.

The resections were for the most part difficult operations; only in one-third was it noted that the procedure was relatively simple. The difficulty was due to the fact that in about 20 per cent, the tumour was adherent to liver and pancreas; and in about three-quarters of the cases there was extensive glandular involvement. One resection is to be reckoned as an almost total gastrectomy. Five times the colon was invaded by the growth, and had to be removed with the stomach; three of these died; one is alive and well one year after operation, and the other was well for two years, then had recurrence which led to common duct obstruction. In three cases, the operation was done in two stages, the first being a gastro-enterostomy. One patient remained well four years. In the second the result is equally good; while in the third, three weeks after the first operation, unexpected difficulties were found, due to the unusual increase in the size of the tumour.

The method of treating inoperable carcinoma of the stomach by the **X-rays** as employed by Czerny, has been elaborated by Finsterer[8] in the following manner. The abdomen is opened under local anæsthesia and gastro-enterostomy performed if possible. The recti are then divided transversely, three fingers' breadth above the umbilicus. Gauze is packed under the edges of the incision, which is left open, forming a rhomboidal space in which the anterior surface of the stomach is freely exposed and may be treated by irradiation. He has thus treated 7 cases. 4 were much improved. 3 patients are dead: 1 from bronchopneumonia, while the other 2 had extensive liver metastases. None of the patients developed peritonitis, or a hernia through the large wound.

Gastrostomy.—Ropke[9] thinks that the usual methods of forming an oblique or tortuous canal fail, by reason of traction which changes them into direct and leaky fistulæ. He reports a case of cancer of the œsophagus in which he performed gastrostomy by the following method. The omentum was separated from the greater curvature of the stomach as far as the pylorus. A quilted suture was then passed through both walls of the stomach along a line parallel to, and two fingers' breadth from the greater curvature. A strip of stomach below this suture was then cut away, beginning at the pylorus and extending to the fundus, where the strip was left attached. The quilted suture was buried by inverting the cut edges of the stomach, and by continuing this inverting suture on to the strip of stomach, the latter was converted into a small tube. This tube—in Ropke's case 22 cm. long—was drawn up through a tunnel under the pectoral muscle toward the left clavicle, and its open end was sutured to a small opening in the skin. The abdominal wound was then closed completely, the patient being fed by the tube eight days later. No leakage occurred. [An operation of this complexity is unsuited to the palliative treatment of œsophageal cancer. A further drawback is the delay in feeding by the new route. —B. G. A. M., H. U.]

Volvulus of Stomach.—Kerr[10] defines idiopathic volvulus of the stomach as a rotation of the organ around the axis of the lesser curvature occurring apart from any other pathological condition.

The stomach turns through an arc of 180 degrees from left to right and from behind forwards, so that the greater curvature comes to lie above, under the left lobe of the liver and diaphragm, while the lesser curvature is below. The posterior surface lies under the anterior abdominal wall, separated from it by the great omentum. None of the reported cases showed any degree of strangulation. The lumen of the pylorus is obliterated by the rotation before that of the cardia, thus increasing the gastric distention. The transverse colon usually lies above the stomach, and is obstructed by the distention of the latter. (In Kerr's case the gastro-colic omentum was ruptured, and the colon lay below the stomach.)

The cause of this rotation is problematical, but Kerr thinks it is due to lack of splanchnic control, associated with laxity or rupture of the stomach ligaments. The usual symptoms are a sudden onset of pain and distention. Vomiting may occur at first, but then ceases when the cardia is occluded, while the distention increases. The stomach tube cannot be passed. The upper abdomen is greatly distended, while the lower part remains flat. Immediate operative treatment is indicated. The stomach should be aspirated, and then replaced in its normal position.

Intussusception of Stomach and Duodenum.—Wade[11] reports an interesting case of a pedunculated fibromyoma of the stomach which had passed through the pylorus and duodenum into the jejunum, dragging after it the stomach wall and producing an intussusception.

The patient had suffered for some time from gastric crises due to partial invagination of the stomach, and from attacks of slight jaundice, probably caused by pressure of the tumour of the intussusceptum on the orifice of the common duct. Probably these attacks terminated by natural reduction of the intussusception. During the last two days the symptoms were those of total obstruction. At operation, the invagination was reduced, and the pedunculated tumour excised with the portion of stomach wall from which it arose.

Hour-glass Stomach.—The possibility of congenital hour-glass stomach is admitted by Tuffier and Roux-Berger,[12] but they think that it is very rare. By far the most frequent form of hour-glass stomach is that caused by callus ulcer of the lesser curvature. The stricture is generally nearer to the pylorus than the cardia, and in the cardiac pouch there is stasis of food—an important point in the diagnosis between true, and false or spasmodic biloculation, which closely resemble each other on radiographic examination. The symptoms are those of pyloric obstruction. The *x*-rays afford the greatest help in diagnosis.

The authors regard annular gastrectomy (resection of the stricture), with anastomosis of the two halves of the stomach, as the best treatment. This may be undesirable in certain cases, e.g., when the patient is not in a condition to stand so severe an operation, in the presence of extensive adhesions, when the constriction is high up towards the cardia, or when it is complicated by pyloric stenosis. In these cases gastro-enterostomy is indicated.

Acute Dilatation of Stomach.—According to Borchgrevink,[13] the symptoms are vomiting, abdominal distention, and collapse ; together with pain and tenderness over the swollen stomach, great thirst, and scanty urine. The vomiting is frequently repeated at short intervals. Distention is usually greatest on the left side. Gradually, the patient's strength fails and the pulse-rate increases. Sudden collapse may occur, and in many cases this is the first recognized signal of the illness. From a study of the literature, and from his own experience, he urges the value of the **Prone Position.** In 22 out of 26 cases this proved curative, and in most of them the immediate relief when this simple change of position was adopted was most striking.

REFERENCES.—[1]*Pract.* 1913, i, 907; [2]*Med. Press and Circ.* 1912, ii, 2[illegible]; [3]*Lancet*, 1913, i, 600; [4]*Deut. med. Woch.* 1913, 554; [5]*Jour. Amer. Med. Assoc.* 1913, ii, 340; [6]*Beitr. z. klin. Chir.* 1913, 421; [7]*Berl. klin. Woch.* 1913, 9[illegible]; [8]*Münch. med. Woch.* 1913, 855; [9]*Zentralbl. f. Chir.* 1912, 1319; [10]*Ann. Surg.* 1912, ii, 997; [11]*Surg. Gyn. and Obst.* 1913, ii, 184; [12]*Presse Méd.* 1913, 409; [13]*Surg. Gyn. and Obst.* 1913, i, 662.

STOMACH, DILATATION OF.

(*See* OPERATIONS, COMPLICATIONS FOLLOWING.)

STOMACH, FIBROMATOSIS OF.

Robert Hutchison, M.D., F.R.C.P.

This condition is also known as "linitis plastica" and as "cirrhosis of the stomach," and a paper by Lyle dealing with it under the latter title was summarized in the last volume of the ANNUAL. Alexis Thomson and Graham[1] have recently published another careful study of the condition, using the term "fibromatosis" to describe it, and their conclusions on the whole agree with those of Lyle already referred to. They believe that they are in a position to clear up the long-standing controversy as to whether the condition is simple or malignant. They have found that it is usually simple, but that there occurs a diffuse infiltrating form of scirrhous cancer which, in its distribution, resembles fibromatosis, and can only be distinguished from it by careful and prolonged microscopical examination. They have no faith in the results of the "rapid" examination of sections prepared whilst an operation for the disease is in progress. They have always found the fibromatosis to be associated with the presence of an ulcer (which, however, may have become malignant), and therefore consider that the condition might more fitly be termed "ulcer fibromatosis."

Two chief forms may be distinguished: (1) Localized, which starts at the pylorus and spreads along the lesser curvature; (2) Diffuse—so-called "leather-bottle stomach." This variety the authors are inclined to suspect is always malignant, but they admit that further observations on the subject are required before this view can be definitely accepted. Their paper contains a minute account of the naked-eye and microscopic characters of gastric fibromatosis, and is profusely illustrated.

REFERENCE.—[1]*Edin. Med. Jour.* 1913, i, 7.

STRABISMUS.

A. Hugh Thompson, M.D.

A new operation for squint is practised and described by Bishop Harman,[1] the main practical advantage of which is that it does not necessitate the patient's being kept in bed or the bandaging of both eyes and can therefore be performed in the out patient department. The same can be said of an ordinary tenotomy; but the very unsatisfactory results which commonly follow from this operation and the frequency with which secondary divergence is seen in those who have had tenotomy performed in childhood, has caused ophthalmic surgeons very generally to abandon it in favour of the advancement of the antagonist. Harman's operation is a **Subconjunctival Advancement** by means of a special reefing forceps and sutures, the opposing surfaces of the tendon having been previously scraped by a special tendon rasp. For a description of these instruments, and of the whole operation, the reader is referred to the original papers. One point which applies not only to his own, but to all operations for advancement, may be given here. The suture inserted into the sclera should lie parallel to the corneal limbus, and not at right angles to it. By the former method the tension on the suture is decidedly less than by the latter. The reason why the parallel suture is not more generally employed is probably the difficulty in fixing the globe while the suture is being inserted. Harman overcomes this by a special temporary suture by which the globe can be held firmly. A more convenient method is to use a special fork devised by Rayner Batten.[2] *Fig.* 72 shows the fork inserted into the sclera, fixing it so that the operator can pass the needle through the required amount without difficulty.

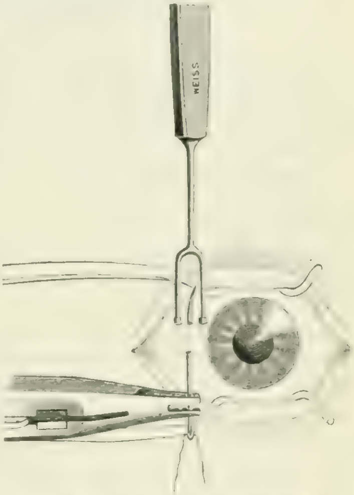


Fig. 72.—Rayner Batten's Fixation Fork.

Although, as has been said, the old operation of tenotomy ought to be abandoned, according to the best opinions, this does not apply to operations for **Partial Tenotomy,** by which, in cases where it may be necessary, the effect of an advancement may be increased. This is best performed by Harman's method.[3] He makes three separate parallel cuts, each part way only through the tendon, the two outer ones going exactly half-way through, the middle one three-quarters through. The result is to lengthen the tendon without dividing it. The two diagrams (*Fig.* 73) show this: *b* is the capital cut; *a*, *a'* the two lateral ones, and *c* the axis of the tendon. The left hand

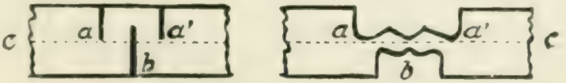


Fig. 73.

diagram shows the original shape of the tendon, the right hand one the alteration caused by the cuts. In order to facilitate the middle cut, Harman has devised a special director-forceps[1] (*Fig.* 74), the lower blade of which has a longitudinal groove on its inner surface, while the upper one has a corresponding slot, and a transverse mark at the middle point. The middle cut is made by running a knife along the groove to the required point, the lateral cuts at each side of the forceps by scissors.

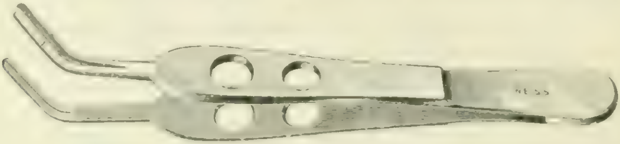


Fig. 74.—Harman's Director-forceps.

Perhaps on no point does the practice of different ophthalmic surgeons vary so widely as in **Prescription of Prisms.** Some statistics of definite results collected by Reber are therefore worth quoting.[2] In 1008 cases in his practice, symptoms traceable to defective muscular equilibrium not cured by correcting the refractive error, were in evidence. Of these 602 were cases of exophoria. In 190 of them prisms were ordered (base outwards) for exercise only. In 130 of these (68 per cent) the result was good. In the remaining 412, prisms (base in) were incorporated in the patients' glasses either for constant use or for reading only. In 328 of these (79 per cent) the result was good. There were only 56 cases of esophoria causing symptoms. In half of these, exercising prisms were ordered (base in), and the result was good in 50 per cent only. In the other half, prisms (base out) were prescribed for constant wear, and the result was good in 24 out of 28 (85 per cent). Lateral errors never cause symptoms in anything like the same proportion of cases as do vertical errors, and the number of times that hyperphoria—itself a much less common condition than exo- or esophoria—needed correction was 350. In 14 cases, exercising prisms were tried, but in only one case was the result good. On the other hand, vertical prisms were incorporated in the patients' glasses 336 times, and the result was good in 297 cases (88 per cent), the highest percentage of good results of any. These, according to the reviewer's experience also, are by far the most satisfactory cases in which to order prisms.

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SUGGESTION IN THERAPEUTICS: ITS LEGITIMATE USES.

Purves Stewart, M.D., F.R.C.P.

The bulk of English physicians at the present time appear to have relatively less enthusiasm than their colleagues abroad for this form of treatment, although we must not forget that it is largely upon the observations of Elliotson of University College, London, in [illegible] et

Braid of Manchester, in 1841, and of Esdaile, an English physician in Calcutta, in 1845, that modern hypnotism is based.

This is not the occasion for a historical or bibliographical study of psycho-therapeutics. I prefer to limit myself to a brief account of the fundamental data, as at present conceived, of suggestive therapeutics, and to indicate some of the more important indications and contra-indications for its employment. For much of the material of this article I am indebted to the works of Forel,[1] Moll,[2] Tuckey,[3] Bramwell,[4] Crichton Miller,[6] and others, which I have freely utilized.

It has been well said that successful medical practice without the employment of suggestion is impossible. There is always the influence unconsciously exercised by the mind of the physician upon that of his patient, varying with the personality of both. But, in addition, we may sometimes deem it advisable specially, and it may be exclusively, to lay stress upon psycho-therapeutics. For this purpose various methods may be employed. Before describing them, a few preliminary hints may be offered to the practitioner who proposes to obtain therapeutic results by such means.

Firstly, an accurate diagnosis of the case must be made, and adequate grounds must be present to call for the employment of suggestive therapeutics. Sometimes, it is true, as Forel has pointed out, the phenomena of hypnosis may actually be used for aiding in the process of diagnosis, but such cases are exceptional. The hypnotic "operator" requires patience, enthusiasm, and a confident, unhesitating, but not aggressive, manner: qualities which are not found in every medical practitioner, however skilled he may be in other respects.

The person who is to be hypnotized should be approached frankly and naturally. "It should be explained to him that there is nothing unnatural or uncanny about the procedure, but that it is a characteristic of the nervous system which applies to everybody. He is told that he will be readily influenced or fall to sleep" (Forel). This, it will be observed, is already the first stage of suggestion. Some operators at the first séance are content with gaining the patient's confidence and overcoming any prejudice which he may have against hypnotism, no special effort being made to induce hypnosis. In some cliniques, e.g., that of Liébault, Wetterstrand, and others, the patient, on paying his first visit, is directed to sit down and to watch the hypnotic treatment being applied to others. This gives him confidence, and also arouses his imitative faculties. In most cases, however, we have only a single patient to deal with at a time.

He is placed in a comfortable easy-chair, with or without arms. The chair may be so placed that one side touches the wall of the room, so that, later, the operator can assist a suggested catalepsy of the patient's arm, if he is not quite certain of success, by leaning the limb against the wall (Forel). The patient must not be in a state of excitement, anxiety, or expectant tension. This last condition is what spoils the first attempt at hypnosis in a large number of patients, who imagine and expect all sorts of weird and wonderful phenomena.

Other patients are unwilling subjects, or are afraid they cannot be hypnotized, and in consequence they produce in themselves an auto-suggestion of an antagonistic nature, which is often very difficult to overcome.

The patient takes his place in the armchair. He is told to relax his muscles, and to try and make his mind a perfect blank, to think of nothing at all. Complete silence must be obtained. He is then asked to fix his eyes and his attention on some visible object—the operator's eyes, or hand, or a small glittering metal object held above the level of the eyes, and close enough to necessitate an effort of convergence, thereby tiring the ocular muscles. After about a minute of this staring on the part of the patient, the operator begins his verbal suggestions in a firm, loud, and monotonous voice. He suggests the onset of natural sleep thus: "Your eyes are becoming moist; they are quite moist. Your sight is growing dim and misty. Your eyelids are becoming heavy; they are very heavy. Your limbs are becoming pleasantly warm, and a numbness is creeping over your arms and legs. Your arms are becoming as heavy as lead." (Meanwhile the operator raises the patient's hands by the wrists and makes them fall with a slight push.) "My voice is becoming muffled. You are feeling more and more sleepy. Your eyelids are so heavy that you cannot keep them open." (Meanwhile he slightly depresses the object at which the patient is gazing, so that the patient's lids follow the eyeballs downwards; if the eyelids close spontaneously, so much the better; if not, the operator gently closes them.)

The effect of the foregoing procedures varies in different patients; some merely feel a slight torpor with disinclination to open the eyes; others will fall into a deeper sleep, during which the further stages of catalepsy, somnambulism, etc., can be suggested. These deeper states of hypnosis have been divided by some observers into various definite stages, but such dividing lines are quite artificial.

Once the patient is in the "first stage" of lethargy, the operator lifts up an arm into a certain position, e.g., against the wall or against the patient's own head, meanwhile suggesting that the limb is rigid, and that it will be irresistibly drawn against the wall or head, as if by a magnet, so that it is impossible for the patient to put it down. In a successful case the limb remains rigid in the suggested position. It should be remembered that the patient is completely conscious all the time, and that he both hears and remembers everything said to him by the operator, and can reply to him. If the patient tries to depress his arm, the operator quickly prevents him, and continues to suggest somewhat as follows: "You see you are getting sounder and sounder asleep. Your arm is growing more and more rigid. Now you cannot depress it." In critical and refractory cases it is wise to avoid the suggestion of catalepsy of the arm at the first seance. In deeper degrees of hypnosis the patient becomes increasingly drowsy, though still able to hear every word addressed to him. In Liébeault's "third" degree, a movement communicated to a limb is continued automatically by the patient, e.g., if the forearm be alternately pronated and supinated, it will go on doing so, until the operator directs it to stop. In the so-called "fourth" degree the patient only hears what is said to him by the operator; to all other stimuli he is insensitive.

During the stage of catalepsy the operator may suggest the occurrence of anæsthesia of one or more parts of the body, or the disappearance of pain from a part previously painful, meanwhile touching the painful part, and declaring at the same time that the pain is disappearing. The operator asks the patient as to the result, and in many cases the patient admits that the pain is relieved. After the deepest degrees of hypnosis—so-called somnambulism—the patient has no subsequent recollection of what he has done during the hypnotic state. In order to wake the patient, it is enough to suggest that he should wake up at once, accompanying the suggestion, perhaps, by blowing lightly on his eyes. Before allowing the patient to wake up, the operator should suggest to him that he will feel no disagreeable after-effects on waking; but that, on the contrary, he will feel fresh and normal in every respect.

Innumerable modifications of the above procedures are employed. Every operator discovers for himself minor variations of suggestive methods, which he has found by experience to be specially suitable to his own personality, and therefore efficacious. Thus Woods[5] discards external objects on which to fix the patient's eyes, and commences by placing one hand on the epigastrium and with the other gently stroking the head, face, or arms. Additional help may also be obtained by means of static electricity, as described by Ash,[6] who places the patient's chair on an insulated platform, and applies a gentle static breeze to the head. The effect of this is remarkably soothing, and enables the patient to relax himself more completely, both physically and mentally. He is then in a better condition to receive suggestions from the operator, or to give himself such self-suggestions as may be desirable.

In most cases it is unnecessary to send the patient actually to sleep. Suggestions can almost always be made with equal efficacy with the patient awake. Some patients who cannot be, or are unwilling to be, hypnotized, are nevertheless highly susceptible to waking suggestions. The patient is placed in a comfortable chair in a quiet room, and is made to relax his muscles to the utmost. After a period of silence, perhaps accompanied by gentle epigastric pressure with one hand and soft stroking of the head and face with the other hand, the suggestions are then uttered by the operator, quietly, deliberately and, above all, confidently. Woods advises those who are beginning the practical study of suggestion to commence by producing the hypnotic sleep, since waking susceptibility is best marked in patients who have previously been put to sleep once or twice before. Nevertheless, once the operator has acquired confidence and experience, it is often possible to produce marked response to suggestion in the waking condition, even in patients who have never been hypnotized before. Thus the operator lifts the patient's arm, and says, "Now you cannot move it." In a successful case the limb remains in a condition of cataleptic rigidity. Apart from producing gross physical phenomena such as these, the operator can suggest that a patient's pains are disappearing, that he is losing various phobiæ or feelings of apprehension, that tics or habit-spasms, abnormal cravings, etc., are passing away, and so on.

The term **Auto-suggestion** is used when the ideas are suggested by the patient to himself, and not, directly at least, by an outside operator. In some cases an individual may be able to induce actual sleep by auto-suggestion. The monk of Mount Athos is said to induce an ecstatic trance in himself by gazing at his own umbilicus. To take more homely examples, we are all familiar with the drowsy effect of gazing at a glowing red fire. Constantly repeated, regular, monotonous, auditory stimuli, not too violent, such as the ticking of a clock or the distant breaking of waves on a seashore, may also induce sleep. The mere habit of going to bed and of assuming a particular position each night, at a particular hour, induces sleep in most people, altogether independently of the existence of special physical fatigue during the preceding day.

Apart, however, from the hypnotic sleep, auto-suggestion may induce innumerable other symptoms. Hypochondriasis is the effect of morbid introspection, together with exaggeration of minor discomforts by auto-suggestion. Hysterical paralyses, contractures, and anæsthesiæ are also probably the result of auto-suggestion, sometimes induced in the first instance by a local stimulus or injury, directing the patient's attention to the afflicted part.

But patients may also be taught to employ auto-suggestion curatively for the relief of various symptoms (e.g., pain, vertigo, insomnia, functional paralyses, etc.), provided always that no serious organic hindrance be already present. The curative action of certain "holy springs," such as that of Lourdes, depends for its success upon the faith or auto-suggestion of the sufferer and upon the absence of gross organic disease. The same remark applies to the occasional cures wrought by "Christian Science," with its perpetual reiteration of incoherent, but, on the whole, reassuring sentences, its denial of the existence of pain or disease (and even of death!), combined with a shrewd system of pecuniary depletion.

Persuasion is a method of treatment which has been specially elaborated by Dubois[1] of Berne, who discards the ordinary methods of suggestion, whether in the hypnotic or in the waking state. His aim is to instruct the patient by explaining to him that it is his own mind which, by morbid introspection and excessive attention to disagreeable symptoms, has been maintaining or aggravating these symptoms. He is told that his own intelligence and will-power have to be brought into play. Such a method, appealing directly to the patient's reason, differs fundamentally from ordinary suggestion, where the patient's reasoning faculties are either evaded or deliberately put out of action.

PSYCHO-ANALYSIS.— Freud, Breuer, and their disciples have elaborated a theory of hysteria according to which all hysterical symptoms are the result of some psychical trauma of a sexual nature. The term "sexual" is here used so as to include not only the familiar gross sensory and emotional experiences connected with the reproductive organs, but also other groups of emotions, such as family affection, outside the ordinary meaning of the word. According to Freud, this intense emotional experience, constituting the sexual trauma, only produces hysteria when it is "repressed," i.e. when it is denied its normal reaction or expression, e.g., of anger, of joyful satisfaction, etc. The emotion, by an effort of will, is prevented from dominating the patient's attention at the time, and is consequently bottled up or submerged ; and the individual acquires the habit of keeping the incident out of his consciousness. As a matter of fact, he may apparently forget it altogether. Nevertheless, this sexual trauma, not finding its normal outlet at the time, continues to attract the patient's attention, and a continuous effort must be made to keep the attention off it. This effort wears out the powers of control and, finally, control being lost, the idea is supposed to gain expression in an abnormal manner by producing various hysterical phenomena. To cure the hysteria, Freud tries to dig up the buried memory of the old trauma by a process of cross-examination termed "psycho-analysis," and he claims that when it is at last brought to the surface of the patient's consciousness and, as it were, ventilated, this emotional "purgation" dissipates the hysterical symptoms.

The methods of psycho-analysis are threefold : (1) In *free association* the patient rests quietly in an easy chair, whilst the operator sits behind, or at least out of sight, and by skilful cross-examination tries to lead the patient's memory back to the original circumstances under which his hysterical phenomena first arose, following up one clue after another. The patient meantime tries to make his mind a receptive blank, and frankly answers all the enquiries made by the operator until he succeeds in giving a detailed account of the original experience which produced the hysterical symptoms. The process is slow and tedious, and numerous séances are often required to track the hysteria to its sexual lair. (2) In *dream analysis* the patient is encouraged to remember his dreams, no matter how fantastic, and to relate them in detail to the "analyst," in the hope that the idea therein contained may offer a clue as to the original sexual trauma. Hypnotic suggestion is often used as an accessory, and the patient is told to dream of something connected with his illness. (3) *Time association* is based on the fact that the mind normally has the power of instantly tacking one idea on to another. The analyst reads out a selected list of utterly dissociated words, one at a time, and at each word the patient is asked to give the associated word which he thinks of in return. Thus, for example, the word "egg" may suggest the response "spoon" in one patient, whilst in another it may suggest the word "chicken," and so on. In any case, a word of some sort is given by the patient as a response to each test-word in turn. The analyst goes through the list, and with the aid of a stop-watch records the number of fractions of a second required in each case for the associated word to be forthcoming from the patient. If a word on the analyst's list is followed by an abnormal hesitation on the part of the patient, this suggests that the submerged trauma is in some way involved. Moreover, the patient sometimes gives the same word again and again in response to different test words, and this recurrent response is supposed to be useful in guiding the analyst as to the original sexual trauma.

INDICATIONS AND CONTRAINDICATIONS FOR TREATMENT BY SUGGESTION.—Before sanctioning the employment of hypnotism or any other form of psycho-therapeutics, we must make an accurate diagnosis, since diseases which are due to gross physical or anatomical lesions are unsuitable for treatment by suggestion. It will be universally admitted, for example, that in a patient with a mammary cancer, an attack of pneumonia, or a transverse lesion of the spinal cord, treatment by suggestion would be not merely foolish but criminal. Not only organic nervous diseases, but certain other nervous maladies, such as epilepsy, paralysis agitans, etc., in which no constant morbid changes have yet been demonstrated, are also unsuitable. Certain psycho-therapeutic physicians claim, with apparent sincerity, to have beneficially influenced the tremors of paralysis agitans and the lightning pains of tabes dorsalis; but the careful reader cannot help regarding such statements with scepticism, and wondering whether the pains thus relieved were really tabetic in origin, and whether the tremors were those of paralysis agitans. On the other hand, it is extremely common to meet with combinations of organic and functional disease in the same patient, and there is no reason why a tabetic individual should not suffer also from hysterical pains, which may be treated with success by suggestion.

Epilepsy is as a rule intractable to suggestion. There is nevertheless a certain type in which an exception may be made, viz., that form in which there is a deliberate and slow aura. In some of these cases the patient may, by an effort of will, fight against his aura, and thus inhibit his threatened fit. In such a patient suggestion may be usefully employed to increase the will power; but suitable cases of this sort are numerically few. Epileptic patients are often specially easy to hypnotize, but this fact does not have any beneficial effect on their epilepsy, save in the exceptional cases above mentioned.

Mental diseases are generally unsuitable, partly owing to the difficulty of hypnotizing such patients. The beneficial effects of asylum environment are partly suggestive in effect; and Woods claims to have hypnotized successfully a certain proportion of insane patients. But other observers, like Tuckey, equally skilled, frankly admit that in mental diseases they have failed to produce the slightest hypnotic influence. The psychoses dependent on hysteria and on alcoholism are probably those which are most likely to show positive results.

Of all the neuroses *hysteria* is the most suitable for treatment by suggestion. In fact, one definition of hysteria, by Babinski, limits the disorder to such symptoms as are produced by suggestion [illegible] by auto-suggestion or by suggestion from outside), and therefore removable by the same means. If, on the other hand, we agree with Freud's theory of hysteria, psycho-analysis is indicated. Whether or not we accept either of these definitions, it is beyond doubt that hysteria is *par excellence* the malady in which suggestive therapeutics have gained their most striking triumphs. Paralytic phenomena, whether sensory (as in anæsthesia) or motor (as in catalepsy, astasia-abasia, aphonia, mutism) often yield to suggestion with dramatic rapidity. Subjective hysterical symptoms of an irritative nature, e.g., hysterical pains, hysterical tinnitus, or pruritus, can also be attacked, after careful exclusion of all organic causes capable of inducing the symptoms. Hysterical convulsions and spasms are also suitable for treatment by suggestion, although, as a rule, they are less rapidly influenced, owing to the fact that during a paroxysm it is more difficult for the operator to secure the patient's attention. It is often advisable to employ some counter stimulus, preferably of a disagreeable kind, e.g., painful pressure over the supra-orbital nerves or in the iliac fossæ, to divert the patient's attention from her active paroxysm. Once this is done, the hysterical fit usually subsides, and we can employ suitable suggestion to prevent its recurrence.

Psychasthenia, with its characteristic phobiæ, obsessions, and habit-spasms, is also beneficially influenced by therapeutic suggestions. Here, however, the patient is often more difficult to influence, and endless patience and tact have to be exercised to combat these recurrent imperious ideas. The most successful treatment of *stammering*, a symptom which is practically confined to psychasthenic individuals, is by a combination of respiratory, vocal, and articulative exercises, together with encouraging suggestions of confidence, enabling the stammerer to make use of his freshly-acquired habits of correct speech. *Tics* and *habit-spasms*, often so inveterate, are also best treated by a similar combination of suggestion with exercises, the physician first of all being careful to search for, and to remove, any sources of peripheral irritation, e.g., by correcting errors of refraction and removing conjunctival irritation in blepharospasm. *Writer's cramp* and other occupation-neuroses are rarely cured by suggestion alone. Here complete cessation from performing the particular action which induces the spasm or pain is essential, usually for a period of several months; and after that, if the action must be resumed, the patient should learn to perform it in as different a way as possible, so as to avoid lighting up the old train of morbid suggestions. The various pen-holders and other apparatus which have been devised for the treatment of writer's cramp have their beneficial effect mainly by suggesting new sensory stimuli instead of the old ones which used to induce the spasm.

Drug habits—alcoholism, morphinism, cocainism, etc.—are favourably influenced by suggestion as a valuable accessory. Personally, I confess to scepticism as to the alleged cure of such habits by suggestion alone. The pernicious drug has first to be withdrawn. This is not the place to discuss the precise method of such withdrawal, whether sudden or gradual, or whether and how antagonistic drugs or antidotes should be administered. Once the patient has been cut off his drug, then comes the useful sphere of suggestive-therapeutics, whereby the physician gives the patient confidence to do his daily work, and to resume his ordinary life without the use of the drug. The physician should employ suggestions of actual distaste, not merely for the one drug, but for all such drugs. Thus it is important that a patient who has been cured of a morphia habit should also become a total abstainer from alcohol. I have repeatedly known the morphine-habit recur when an ex-morphine patient came later under the influence of alcohol. To influence sufferers from drug-habits, the physician must gain the patient's confidence and his respect, and should encourage him to report himself at suitable intervals, partly to verify the patient's statements, and partly to strengthen his powers of self-control by suitable suggestions.

Homosexuality and the numerous other varieties of *sexual abnormality* are also treated by the psycho-therapeutist, although it must be confessed that a very large proportion of such cases occurs in individuals who are congenitally abnormal—moral deviates—and the chances of cure are not often bright. Nevertheless, it is the duty of the physician to make the effort to supplant morbid impulses by healthy ones, by a combination of suitable suggestions with healthy moral and physical surroundings.

Suggestion may also be employed to influence the functions of various *internal* organs, e.g., to combat gastric, intestinal, vesical, and even uterine disorders, provided always that there is no underlying organic mischief. Thus in suitable cases nervous vomiting, constipation, enuresis, dysmenorrhœa, etc., may all be benefited by suggestion. Whilst it is true that an individual has no direct voluntary control over the activity of his viscera, nevertheless the effect of emotions in producing visceral disorders, such as vomiting, diarrhœa, frequency of micturition, etc., is familiar to all, and it is by some indirect route of this sort that suggestive therapeutics act in the relief of visceral neuroses.

Insomnia is sometimes treated by suggestion, but it is only a small and carefully selected proportion of cases that are successfully influenced. It is obviously futile to treat by this method cases of sleeplessness due to such causes as gastro-intestinal toxæmia, persistent pain or cough, arteriosclerosis, etc.

To sum up, suggestion, like every other method of scientific treatment, medical or surgical, is of value in suitably selected cases, and it should be the endeavour of the physician to make the proper selection. The honest psycho-therapeutist will always refuse to attempt treatment by suggestion in unsuitable cases. To claim that suggestion is a panacea for any particular class of diseases, even of functional disorders, is to bring an excellent therapeutic weapon into undeserved disrepute.

[illegible]—[1] "Hypnotism," 5th ed. transl. by Armit, 1906; [2] "Hypnotism," 4th ed. transl. by Hopkirk, 1909; [3] "Hypnotism and Suggestion," 3rd ed. 1913; [4] "Hypnotism," 1903; [5] *Latham and English's System of Treatment*, iii, 156; [6] "Hypnotism and Disease," 1912; [7] "Pathology of the Suggestive States," transl. by Richards, 1909; *Brit. Med. Jour.* 1913, Feb. 22.

SULPH HÆMOGLOBINÆMIA. *Herbert French, M.D., F.R.C.P.*

A very noteworthy and probably unique case is recorded by Haldin Davis.[1] The main symptom was a remarkable coloration of the face recalling argyria; instead of being of the normal pink tint it was stained a deep slate hue, almost a blue-black. There was no similar discoloration of the body or limbs. Alkaptonuria, ochronosis, and argyria were all excluded, and the diagnosis of sulph-hæmoglobinuria was established by spectroscopic examination of the blood. What was most remarkable, however, was that it was only blood obtained from the head region that gave the absorption bands of sulph-hæmoglobin; blood from the fingers showed no abnormality. The fact that sulph-hæmoglobinæmia can thus be localized to the head alone is a new discovery, and one that must, if confirmed, throw fresh light on the pathology of this obscure affection. It has generally been attributed to the absorption of sulphur-containing gases from the bowel, but this can hardly be the cause in a case in which the blood in the head and face contains sulph-hæmoglobin continuously, whilst that in the trunk does not. Further results are promised in a future communication.

Reference.—[1] *Lancet* 1912, ii, 1145.

SUTURES. *Priestley Leech, M.D., F.R.C.S.*

Pearson[1] draws attention to the fastening of a subcuticular suture by a shot (*Fig.* 75). Reder[2] suggests knotting the ends of the suture where they emerge through the skin at each end of the incision. Fine silkworm gut is used with a fine, straight, triangular-pointed needle. Halsted,[3] of Baltimore, states that the Johns Hopkins school seems to be almost alone in the advocacy of silk as a ligature and suture material; Theodor Kocher has, however, used silk to the exclusion of catgut, since 1883 at least. Halsted has fine black silk, two or three yards in length, wound on glass spools which are steamed in heavy glass test tubes. From year to year and at various periods he has tried catgut sterilized by the best American purveyors, but has come back to the use of silk, as the results have been better. Catgut seems to irritate the wounds, even if sterile, and he thinks it may serve as a culture medium for saprophytic organisms which are carried into it from the deep epithelium and follicles of the skin. Straight needles may be threaded with fine silk, and basted into strips of thin muslin and gauze, which may be folded and stored for subsequent use. (*Plate LIII, Fig. A*) illustrates the usual method of controlling hæmorrhage from the larger vessels which have been isolated. Where they have not been isolated, the needle is passed first under or between the vessel or vessels to be ligated, and then a second transfixion is made superficially

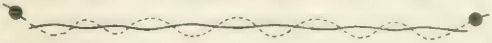


Fig. 75.—Diagram of the "Shotted Subcuticular Suture" properly applied. The continuous line represents the cutaneous incision; the dotted line the path of the suture through the corium. Note the points of emergence of the suture at each end where the shot is applied—not in the axis of the incision, but to one side.

closer to the point of the clamp and in front of it; the clamp is then tilted in the opposite direction, while the operator ties the knot behind it (*Plate LIII, Fig. B*). With fine silk one can secure hæmostasis that is not possible with catgut (as, for example, in the control of small bleeding points over the trachea, in the pia mater, the periosteum, and the suture of wounds of vessels). He has seen a ligature of coarse silk, tied with crushing force, blown off, as it were, from the aorta of a dog—a ligature which had been applied 12 mm. from the proximal end of the divided vessel. This same artery was then safely closed by a ligature of silk, No. A, which pierced it. He seldom uses a coarser silk than No. C (*Plate LIV, Fig. C*) for closing long abdominal wounds. Occasionally he reinforces with one or two sutures of silver wire, which include skin, and the anterior and posterior layers of the sheath of the rectus; otherwise fine silk (Nos. AA, A, and C) is used throughout for sutures as well as ligatures. He is using the interrupted variety of suture more frequently than formerly. Silk should not be used for ligating or suturing in the presence of infection; it should not be coarser than necessary, and the parts should not be brought together under such a degree of tension as to cause necrosis, or interfere greatly with the blood supply. The combined use of silk and catgut in a wound should if possible be avoided. The epithelial stitch is made with 00 silk, and a needle to correspond; this stitch is used in operations on the dog.

In many operations he uses a fine batiste (sometimes gauze or silk) dipped in celloidin to paste over the wound. Since 1894 he has covered fresh wounds with silver foil. He believes that healing is better under a moist scab than under a dry one.

REFERENCES.—[1]*Med. Press and Circ.* 1914, i, 36; [2]*Surg. Gyn. and Obst.* 1914, Feb.; [3]*Jour. Amer. Med. Assoc.* 1913, i, 1110.

SYPHILIS. (*See also* Arthritis, Syphilitic; Cornea; Ear; Heart, Syphilis of; Liver, Syphilis of; Syphilis, Cerebrospinal; Syphilis, Congenital).

C. F. Marshall, M.D.

ETIOLOGY.—Recent research seems to throw further light on the *life history of the Spirochæta pallida*. E. H. Ross[1] describes intracellular bodies found in the mononuclear leucocytes in 145 cases of primary and secondary syphilis, and regarded as homologous with similar bodies (*lymphocytozoa*) found in guinea-pigs and earthworms and proved to be parasitic. They are of two kinds: in one the chromatin subdivides into round or pear-shaped bodies which become free after the cell containing them bursts; in the other it develops spiral coils resembling the *Spirochæta pallida*, and the spirochæta-like bodies seen in the intracellular parasites of guinea-pigs and earthworms. These bodies were found in chancres, glands, secondary syphilides, and less often in the blood. They were not found apart from syphilis, although many controls were made. The bearing of these facts on the life history of the *S. pallida* may be interpreted as follows: the sporozoites are the microgametes or male elements, and the round or pear-shaped bodies the macrogametes or female elements. This, however, can only be proved by observing the act of conjugation. This has not been seen, but further evidence of the parasite being a protozoon with a cycle of sporogony is found in the presence of large cells containing numerous chromatin granules, observed in the deeper layers of secondary syphilides. The technique by which these parasites were demonstrated, known as the "jelly method," and invented by H. C. Ross, is fully described in the original article. After an injection of salvarsan or mercury, the free parasites diminish in number, but the intracellular remain the same. Ross concludes with the suggestion that the guinea-pig parasites might produce in man a mild affection which would modify human syphilis in the same way as small-pox is modified by inoculation with cow-pox. The presumed parasite of small-pox and vaccinia (*Cytoryctes*) belongs to a family of intracellular parasites (*Chlamydozoa*) similar to the above. Ross's results have been confirmed by Jennings[2] and Moolgarkar.[3]

McDonagh[4] describes the life cycle of the S. *pallida* as follows. It begins with a "sporozoïte" or "infective granule," which is motile (? by flagella). This enters a mononuclear leucocyte, within which it grows at the expense of its host. The "sporozoïte" then divides into two. One half becomes transformed into an irregular coil, subdividing into shorter coils which eventually become the spirochætes. The latter represent the microgamete or adult male element. The female element develops from the other half of the sporozoïte, which becomes spherical and extracellular. After fertilization, the zygote is said to divide into sporoblasts, each of which divides into sporozoïtes, which start the cycle again. This completes the spore stage, or sporogony. McDonagh suggests that the syphilitic parasite belongs to the order *sporozoa*, and that an appropriate name would be "*Leucocytozoon syphilis*." He thinks that infection is conveyed by the sporozoïte and not by the spirochæte, and that recurrent lesions are due to the presence of spores, which can start the cycle again. The discovery of spores in material from syphilitic lesions is, therefore, important in diagnosis. The best material for study was from the lymphatic glands. Controls from glands in cases of soft chancre, gonorrhœa, tubercle, and normal glands were all negative. He thinks it probable that the parasite of sleeping-sickness closely resembles in its life history the parasite of syphilis, and that the bodies figured by Mott are analogous to those described above. In a more recent paper, McDonagh[5] states that he has seen the act of fertilization.

Spirochæta Pallida in General Paralysis. (*See also* SYPHILIS, CEREBROSPINAL.)—Previous attempts to find the S. *pallida* in general paralysis having failed, it was assumed that this disease (generally regarded as parasyphilitic or metasyphilitic) was due to the presence of spores or toxins. Recently, however, typical spirochætes have been discovered by Noguchi,[6] using a modification of Levaditi's silver nitrate method of staining. They were found in twelve out of seventy cases of general paralysis, the clinical course and post-mortem findings of which were typical of this disease. They were present in all layers of the cortex except the neuroglia layer, and were absent from the perivascular sheaths, a fact which, together with the absence of any clinical symptoms of cerebral syphilis and the absence of either macroscopic or microscopic gummata, shows that the cases were true examples of general paralysis, and not of cerebral syphilis, nor of a combination of the two conditions such as has been described. Most of Noguchi's cases ran an unusually rapid course, which may account for the presence of spirochætes.

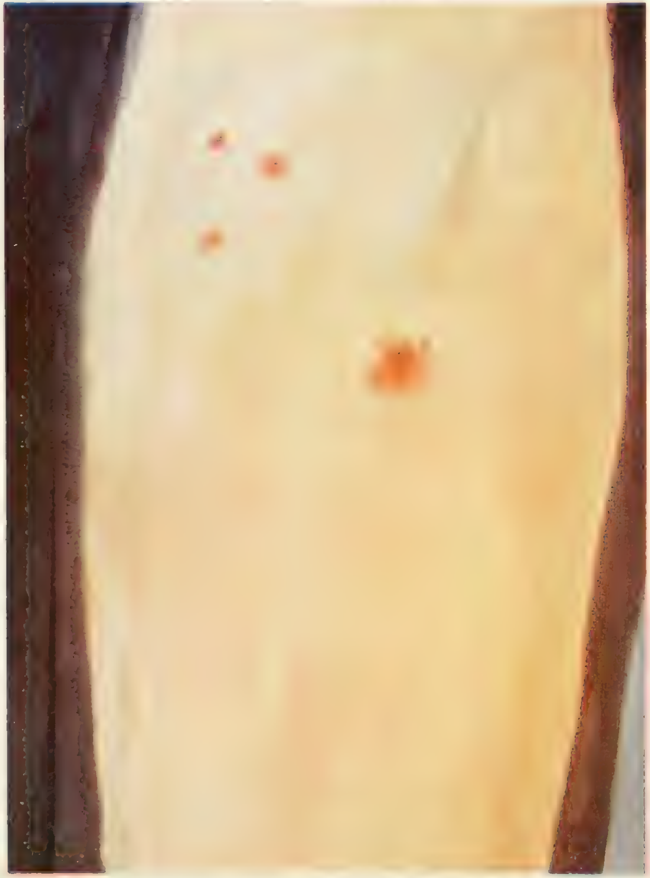
These results have been confirmed by Levaditi and Marie,[1] who found the spirochæte in two out of twenty-four brains examined. In one case, of seven years' duration, the organisms were shown by dark-ground illumination to be alive and active. They were also demonstrated by various methods of staining, and by the Chinese ink method.

DIAGNOSIS. *Cutaneous ("Luetin") Reaction.*—Kytina[2] describes the same types of reaction following the intradermic inoculation of "luetin" as Noguchi (see MEDICAL ANNUAL, 1913). The normal or negative reaction may manifest itself by a slight erythema at the point of injection, which disappears in forty-eight hours, or as a papule surrounded by an erythematous zone which subsides on the fifth day. On this account, reactions appearing at this early period have no diagnostic significance. The positive reactions may be papular, pustular, or torpid. In the papular form an indurated papule appears in twenty-four hours and increases for two or three days, becoming dark red or purple, when it subsides and disappears within seven or ten days. In the pustular form the papule softens after the fifth day, and may rupture or become absorbed. In the torpid form the reaction first resembles a negative one, but becomes papular or pustular in eight to fifteen days. In one case this did not occur till the thirty-sixth day, and on this account Kytina does not consider any reaction negative until it has been watched for thirty-six days.

The luetin injections are made into one arm and the controls (culture medium without spirochætes) into the other. In some cases the control side showed a papular or pustular reaction similar to the inoculated side. This is said to be due to a peculiarity in the skin of syphilitics, especially in tertiary syphilis, which renders it liable to infection and traumatic irritation. The cause of the luetin reaction is said to be allergy, or anaphylaxis.

As the result of 115 cases watched for thirty-six days, Kytina comes to the following conclusions: (1) The test is specific for syphilis, and was negative in twenty-eight non-syphilitic cases; (2) In primary and secondary syphilis it is less constant than the Wassermann reaction, but in tertiary and latent syphilis, parasyphilis, and congenital syphilis it is much more often positive; (3) The reaction is not inhibited by treatment to the same extent as the Wassermann test; (4) A negative reaction is a better criterion of cure than the Wassermann test.

PLATE LV.—LUETIN REACTION IN DIAGNOSIS OF SYPHILIS



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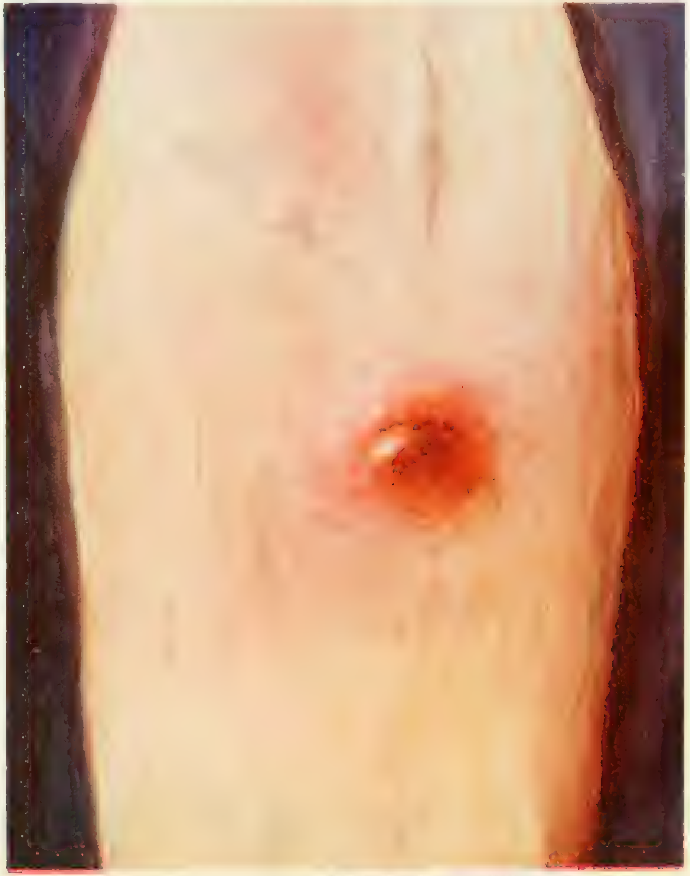

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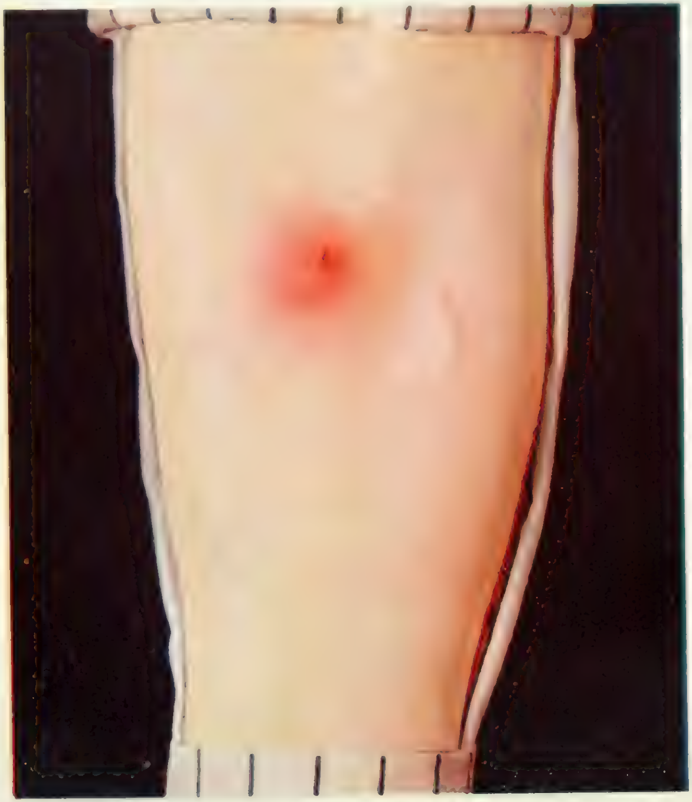
PLATE LIV

LUETIN REACTION



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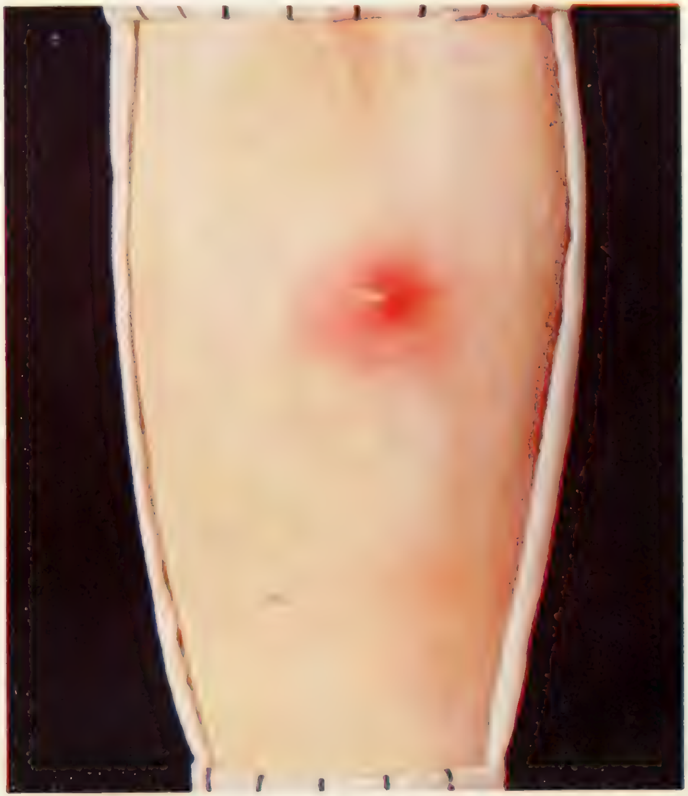

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Wolfsohn[9] also concludes that the test is specific for syphilis, and especially useful in tertiary and latent syphilis and in parasyphilis. He remarks that it is generally positive in treated cases of congenital and secondary syphilis, but that intensive treatment in the later stages may produce a negative reaction. Kaliski,[10] after an experience with 900 injections of luetin in syphilitic and non-syphilitic conditions, regards the test as of little value in primary and secondary syphilis and in parasyphilis, but of service in cerebrospinal and tertiary syphilis. Benedek[11] regards luetin as useful in the differential diagnosis between cerebral syphilis and general paralysis. Three cases of cerebrospinal syphilis gave a strong reaction, manifested by a dark red nodule the size of a hazel nut appearing on the fifth day in the middle of inflammatory swelling. On the seventh day this became pustular and discharged brownish-yellow contents. In eighty-one cases of general paralysis there was a positive reaction in 80 per cent, but much less marked than in the cases of cerebrospinal syphilis. In ten cases of dementia præcox, used as controls, there was a weakly positive reaction in one only (*See Plates LV*, *LVI*, *Figs. A*, *B*, *C*, *D*). Some of the histological changes which characterize the reaction are seen in *Plates LVII* to *LX*, *Figs. A* to *H*, illustrating Benedek's article. This series of illustrations is kindly furnished by the *Munchener medizinische Wochenschrift*.

Baermann and Heinemann[12] have tried luetin both in syphilis and in frambœsia (yaws), with a view to differentiating between the two diseases. They found, however, that there was no difference in the reactions in the two cases, either with extracts of syphilitic tissues or with Noguchi's luetin. They also obtained a similar reaction with a pure culture of the spirochæte of frambœsia prepared from unbroken papules. They conclude that the reaction is specific for syphilis and frambœsia, and that the percentage of positive reactions increases with the age of the disease and the limitation of the lesions, and also with the intensity of treatment.

Fischer and Klausner[13] have used an extract prepared from the lung of a syphilitic fœtus (pneumonia alba), and state that the cutaneous reaction obtained thereby is specific for tertiary and hereditary syphilis. Muller and Stein[14] report similar results with the use of extracts of the organs of syphilitic fœtus, and consider that a negative reaction excludes the presence of a gumma. Comparing the results obtained with such extracts with those obtained with Noguchi's luetin, they are nearly identical in tertiary syphilis, but differ considerably in secondary and latent syphilis and parasyphilis. Whether these differences are quantitative or qualitative requires further elucidation.

The Wassermann Reaction.—Thiele and Embleton[15] have endeavoured to discover the true nature of the antigen and antibody concerned in the Wassermann reaction. They conclude that the so-called antibody is not a true one and is not characteristic of syphilis, but is probably only a stage in the formation of an anti-complementary combination which develops where there is rapid tissue-destruction, as in acute infections, narcosis, and death. In all these processes proteins and their cleavage products are produced and phosphatids liberated. The latter form new combinations, giving rise to non-specific antigen and antibody. In syphilis the destructive process is slow, and the anti-complementary combination is completed by the addition of a lipoid. The destruction of tissue which occurs after acute infections, narcosis, and death explains the apparent Wassermann reactions which have been reported in these conditions, but the authors do not regard them as true reactions. As regards the antigen, the authors find that the complement-fixation property does not depend on the presence of spirochætes, their products, or changes due to their presence, and that non-syphilitic extracts bind antibodies as well as syphilitic ones. They also point out possible errors in the Wassermann test: (1) The antigen itself may be anti-complementary, and may cause a considerable absorption of complement before any inhibition of lysis occurs. (2) Serums often contain anti-complementary substances which increase after keeping.

Major[16] reports the results obtained with the Wassermann reaction in 1200 cases at the Johns Hopkins Hospital. The technique employed was that of the original test, except that an alcoholic extract of fœtal syphilitic liver was used instead of a watery extract. Positive reactions were obtained in aortic insufficiency (50 per cent), in aneurysm (95 per cent), in tabes (64 per cent), in general paralysis (92 per cent). Negative reactions occurred in various brain tumours, multiple sclerosis, progressive muscular atrophy, Friedreich's ataxia, bulbar paralysis, and idiopathic epilepsy. In ten cases of diabetes, only two gave a positive reaction. As regards the reaction in the cadaver, the author quotes Erich's statement that it is a biological, not a cadaveric, phenomenon. He remarks that to have any value the serum should be tested both before and after death, for patients may have had syphilis with no lesions apparent at the autopsy. In twenty-five cases tested before and after death, the results agreed in all but one, a case of aneurysm which had been under intensive treatment. Foerster[17] reports several cases of untreated tertiary syphilis of the skin and mucous membranes in which the Wassermann reaction was negative. (*See also* CEREBRO-SPINAL FLUID; DIABETES MELLITUS.)

The *Hermann-Perutz reaction*[18] depends on the production of a flocculent precipitate by the addition of sodium glycocholate and cholesterin to syphilitic serum. It is described by Jensen and Feilberg[19] as follows:— Two solutions are made: (1) Containing 2 grams of sodium glycocholate and 0·4 gram of cholesterin in 100 grams of 95 per cent alcohol. (2) A freshly prepared 2 per cent solution of sodium glycocholate in distilled water. A 1-20 dilution of the first solution in distilled water is mixed with an equal quantity of the second solution, and 0·4 c.c. of the mixture is added to an equal quantity of the serum to be tested. The serum is first inactivated by heating to 56° C. for half an hour. The tube is shaken and left at 22° C. for twenty-four hours. A flocculent precipitate indicates a positive reaction.

PLATE XVII.

LUETIN REACTION—HISTOLOGICAL CHANGES

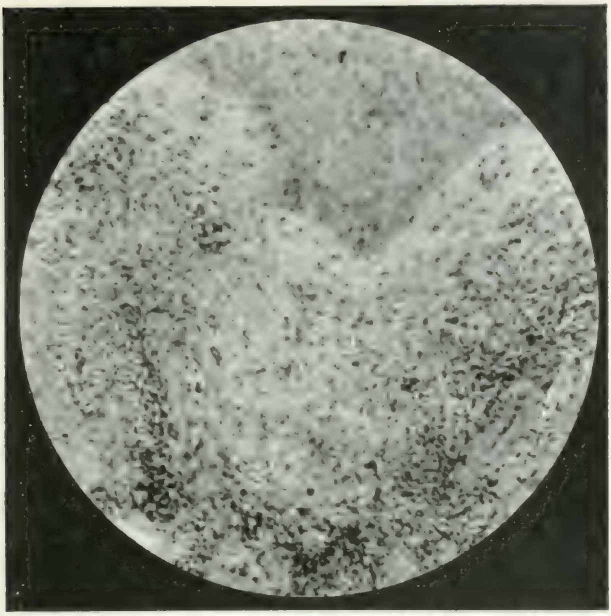


FIG. 1.—[illegible] Reaction [illegible] from the circumferential zone [illegible] of the corium, with but few lymphocytes in the [illegible] epidermis.

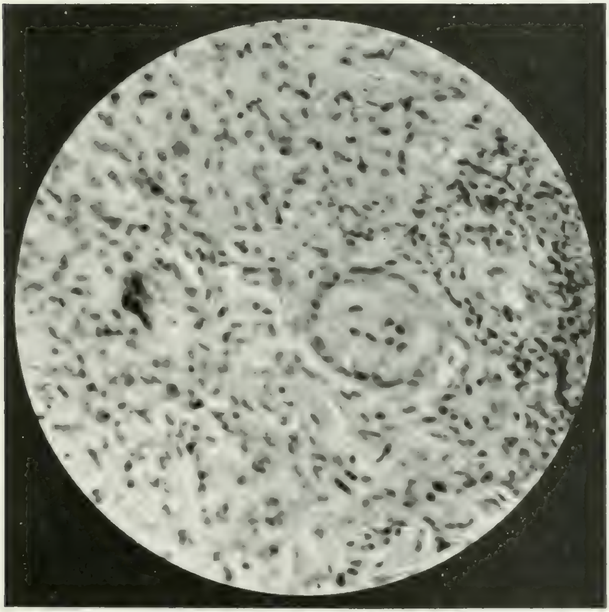


FIG. 2.—[illegible]

MEDICAL ANNUAL, [illegible]

PLATE [illegible]

LUETIN REACTION

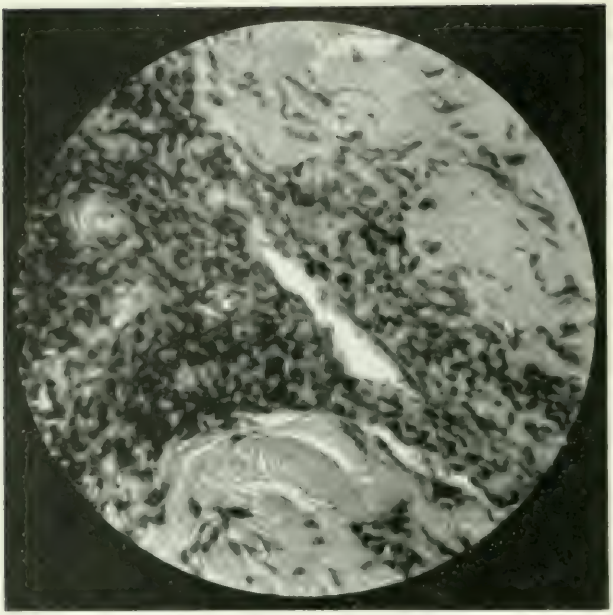


Fig. I.—[illegible]

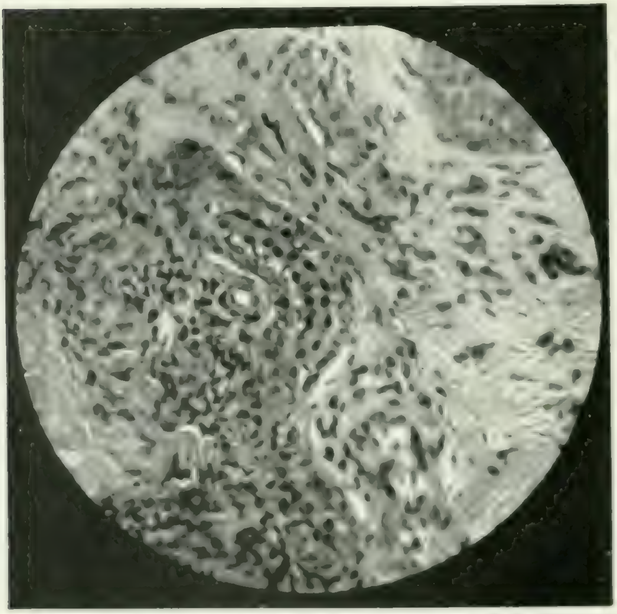


Fig. II.—[illegible]

PLATE LIX.

LUETIN REACTION—*continued.*

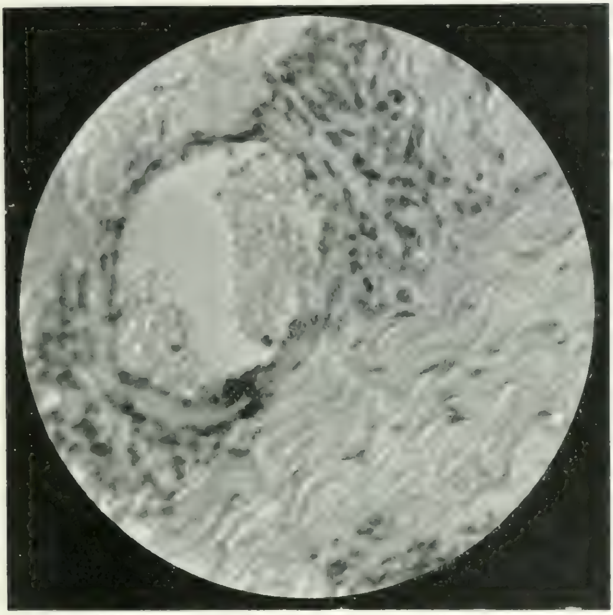


Fig. 7.—Dilated blood-vessels in the corium, with numerous lymphocytes in its walls.

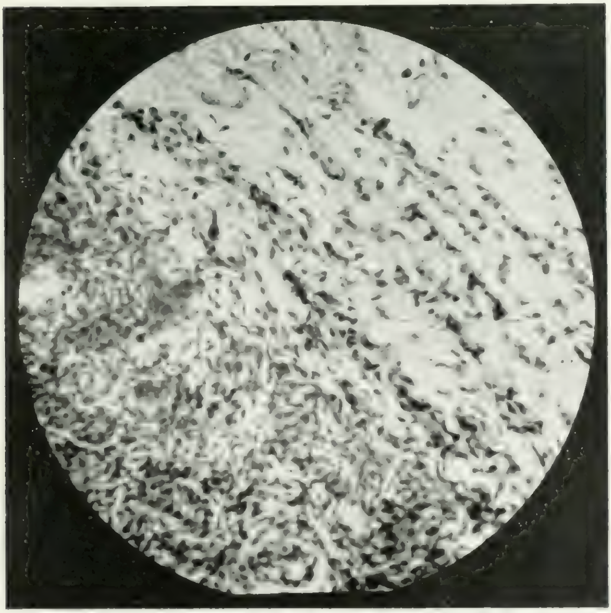
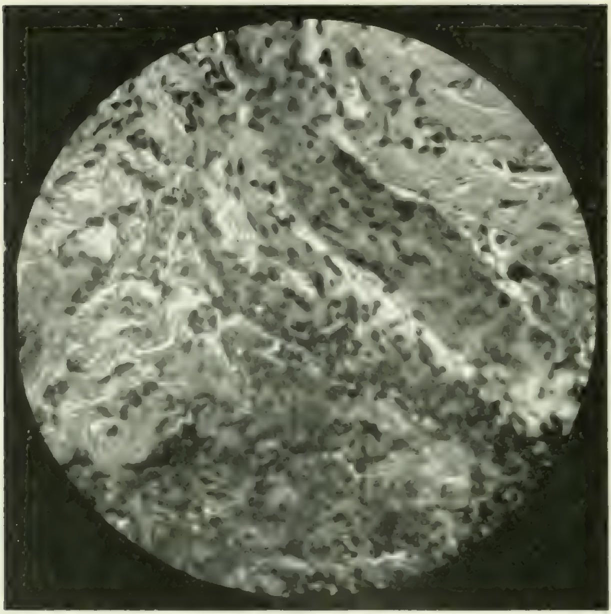


Fig. 8.—Diffuse infiltration in the reticular layer of the corium.

MEDICAL ANNUAL.

PLATE IX

LUETIN REACTION [illegible].



[illegible]

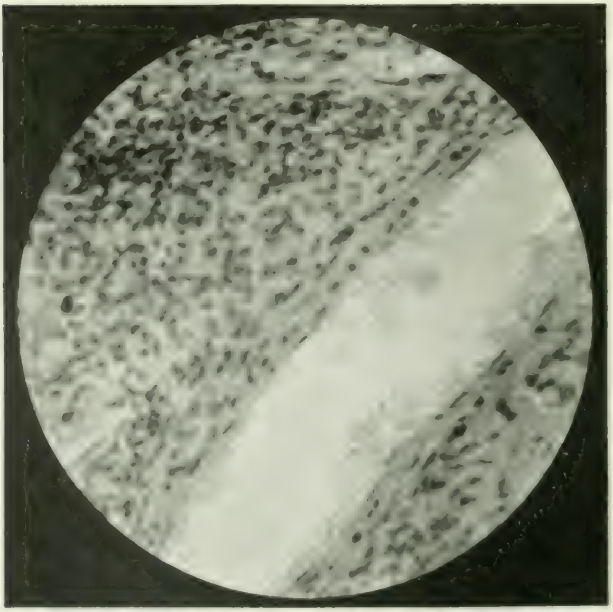


Fig. [illegible]

[illegible]

Although this test does not give such a high percentage of positive results as the Wassermann reaction, it may be used as a preliminary test, as it never gives a positive result when the Wassermann is negative. Lade[20] has tried the Hermann Perutz reaction in 600 cases, and concludes that it cannot supplant the Wassermann test. He only recommends it when the latter cannot be carried out.

Lange's test is a chemical test applied to the cerebrospinal fluid, and said to be diagnostic of syphilitic and parasyphilitic changes in the cerebrospinal system. Major Harrison[21] describes the test as follows: (1) A solution of colloid gold is made by adding 1 c.c. of a 1 per cent solution of chloride of gold and 1 c.c. of a 2 per cent solution of potassium hydrate to 100 c.c. of distilled water. The mixture is boiled and shaken in a beaker, and then mixed with 1 c.c. of 1 per cent solution of formalin. This produces a purple transparent liquid. (2) A 0·4 per cent of pure sodium chloride in double distilled water is prepared for dilution of the cerebrospinal fluid. The latter is diluted in series commencing with 1–10 and ending with 1–40,000 in the thirteenth tube, each dilution being double the preceding one. Five c.c. of the gold solution are added to 1 c.c. of each dilution in separate test-tubes, which are left at room temperature over night. The reaction consists in precipitation of the gold, which is indicated in various degrees by change of colour from red to reddish-blue (the minimum reaction), blue-red, violet, dark blue, light blue, to complete decolorization (the maximum reaction). The degree of dilution at which the maximum change of colour occurs is said to distinguish between syphilitic and non-syphilitic cerebrospinal fluid. Thus in syphilis and parasyphilis the maximum occurs between dilutions 1–40 and 1–80, while in other cases it occurs at a dilution higher than 1–320. The test is quantitative as well as qualitative, the strongest reactions being given by cases of parasyphilis, the next by cases of cerebrospinal syphilis, and the weakest by cases of secondary syphilitic headache. Major Harrison's experience so far confirms that of Lange, but further investigation is required before the test can be regarded as specific. (*See also* BLOOD, EXAMINATION OF.)

TREATMENT.—At the International Congress of Medicine,[22] Ehrlich stated that the biochemical action of **Salvarsan** on spirochætes is not direct but indirect, a third factor found in the body fluids being necessary. In a test-tube the spirochætes fix salvarsan but are not killed. As regards its toxicity, Ehrlich holds that it has no neurotropic effect, because rabbits showed no lesions of the nervous system even after injection of large doses. Further, by means of a delicate reaction with dimethylamidobenzaldehyde, he found that salvarsan has no affinity for the central nervous system. If a rabbit which has received an injection of 0·11 gram of salvarsan per kilogram is killed soon afterwards and its nervous system examined with the above test, the yellow coloration indicative of salvarsan is absent. Again, Ullmann has shown that after injection of rabbits with salvarsan there are only minute traces of arsenic in the central nervous system, less than after the administration of inorganic preparations of arsenic. Degeneration of the sensory nerves does not occur with salvarsan as it does with atoxyl, and according to Ehrlich there is no evidence of any action on the auditory or optic nerves. He attributes the febrile reaction following injection of salvarsan to the liberation of toxins set free by destruction of spirochætes. Another cause of fever is the use of acid solutions, which may cause embolism of the lungs, and hence are dangerous. In answer to those who state that febrile reaction occurs in non-syphilitic diseases (mycosis fungoides, psoriasis, lichen) after salvarsan, and attribute it to cellular destruction, Ehrlich remarks that it may equally be due to the destruction of unknown pathogenic organisms, for salvarsan destroys other microbes which may be present in the body. He attributes neuro-recurrences to syphilis and not to a toxic action, and considers them due to insufficient doses of salvarsan which have left foci of spirochætes in the meninges.

As regards *deaths after salvarsan*, Ehrlich refers to the 164 cases collected by Miskdjian, and eliminates 51 which were not directly due to the drug, and 19 others which occurred in patients weakened by other diseases or where salvarsan was contraindicated. There remain 94 deaths which he admits may have been caused by the drug, but he thinks this figure low when compared with the two or three million injections which have been performed. Against this, he states that some deaths after mercury have not been published. Ehrlich emphasizes the danger of salvarsan in inflammations of the nervous system. Cerebral œdema has often been noticed, and is called by Miskdjian the nervous form of intoxication, but Ehrlich thinks it is caused by meningitis set up by a Herxheimer reaction, and explains affections of the auditory nerve in the same way. In conclusion, Ehrlich advises caution in the administration of salvarsan, and small doses to begin with. He thinks it may sterilize syphilis in the primary stage and lead to considerable improvement in general paralysis. Three diseases are absolute contraindications: Addison's disease, cancer, and the status lymphaticus.

Neisser is of opinion that there is no spontaneous cure of syphilis by the formation of antibodies. He considers that mercury and salvarsan act directly on the spirochætes, both by destroying them and by preventing their development. He recommends combined treatment by **Mercury** and salvarsan in all cases of syphilis except when there are contraindications. He thinks that syphilis may be aborted by salvarsan alone when given soon after infection, but that it is safer to give mercury as well. At first, mercurial preparations acting rapidly, such as salicylate of mercury and calomel, should be used to reinforce the spirillicidal action of salvarsan; later on, preparations which remain in the body and hinder the development of spirochætes, such as grey oil. By "abortive cure" Neisser means cases in which the serum reaction has remained negative after repeated examinations for at least a year. In some, foci of spirochætes may remain which are too small to give a positive Wassermann reaction, but such cases are exceptional. Among abortive cures should be included the results with salvarsan in pregnant women who gave birth to healthy children. Neisser recommends energetic treatment with salvarsan and mercury as soon after infection as possible, even when the diagnosis is not certain. Insufficient doses of salvarsan may do more harm than good, by leaving foci of spirochætes untouched. Neisser is of the same opinion as Ehrlich with regard to affections of the cranial nerves and "neuro-recurrences," that they are due to foci of spirochætes in the meninges remaining after too small a dose of salvarsan. According to Neisser, no precise rule can be formulated as to the duration of treatment, but he continues till the Wassermann reaction has been negative after four or five examinations. He also advises examination of the cerebrospinal fluid before abandoning treatment. When the serum reaction remains positive, especially in latent syphilis with no symptoms, he thinks mercury more efficacious than salvarsan, especially in the form of grey oil.

Of the *methods of injection* of salvarsan, the intravenous is the more rapid, the intramuscular the more durable, since it leaves "depôts" of the drug in the tissues. Of the different oily or saline emulsions for intramuscular injection, Neisser prefers the Joha saline suspension. Comparing salvarsan with **Neo-salvarsan,** the former has a stronger action on spirochætes and the latter is liable to decomposition. As regards dosage, Neisser begins with a small dose of 0·1 to 0·2 gram repeated three times, then larger doses of 0·4 to 0·6 gram at intervals of ten days, the total quantity in a course of treatment being from 2½ to 3 grams for a man and 2 grams for a woman.

Neisser considers that the accidents after salvarsan have been exaggerated. Among the causes of such accidents he mentions oxidation of the drug by exposure to the atmosphere; impurity in the water or saline solution; idiosyncrasy or hypersensibility of the patient, manifested by congestion of the brain with œdema up to hæmorrhagic encephalitis; incorrect dosage, either too large doses or too long intervals. Many secondary effects are due to the action of salvarsan on the spirochætes by setting free endotoxins, and to phenomena comprised under the name of the Jarisch-Herxheimer reaction. Hence it is wise to commence with small doses, and in some cases to use mercury before giving salvarsan. Schreiber has only had three deaths in 7000 injections of salvarsan, one an alcoholic, another in general paralysis, while the third died of pneumonia. He considers that it has no bad effect on the nervous system, and attributes neuro-recurrences to insufficient doses. Contraindications for salvarsan are limited by Neisser to severe alcoholism, cachexia, hepatic affections, and degenerative lesions of the nervous system. He claims favourable results in aortitis and aneurysm and in early cases of tabes, but not in general paralysis.

Blaschko thinks it is too early to form a definite opinion on the results of salvarsan; we should wait ten years before speaking of a radical cure of syphilis.

Hallopeau still considers that **Hectine** is superior to salvarsan, because its administration can be continued for long periods without the dangers connected with salvarsan. He recommends ten courses of forty daily subcutaneous injections of 0·3 gram of hectine, with five days' interval between the courses. The first few injections should be made in the neighbourhood of the chancre.

Ehlers claims that results as rapid as those of salvarsan can be obtained by supermaximal doses of mercury. For this purpose he gives an initial intramuscular injection of **Benzoate of Mercury**, followed by a course of inunction. The dose of benzoate recommended is 15 cgrams for a woman and 20 for a man, or 2½ mgrams per kilo of body weight. He reports 248 cases injected with doses of 10 cgrams and upwards of benzoate of mercury, with good effect in most. Stomatitis occurred in 43 cases and temporary diarrhœa in a few. One case of malignant syphilis died owing to neglect of precautions. Chancres and ulcerative syphilides healed in a few days, but the action was slower on papular syphilides. In primary syphilis, secondaries were prevented. By means of these large initial doses Ehlers thinks that an *ictus therapeuticus* can be attained.

Gibbard and Harrison[23] report their results with **Salvarsan** and **Neosalvarsan** at the Military Hospital, Rochester Row. Comparison of cases treated by mercury alone with those treated by salvarsan were in favour of salvarsan as a routine method. Out of 102 patients treated with intravenous injections of salvarsan, either alone or in conjunction with mercury, and observed for periods ranging from six to twenty-one months, 11 relapsed. Out of 102 cases well treated with mercury, observed for six to twelve months, 85 relapsed. The average period during which the salvarsan relapses remained free from symptoms was seven months, while the mercurial relapses occurred at an average of four months. In 56 cases of primary syphilis treated with salvarsan and observed for periods of six to twenty-one months, only two developed secondary symptoms, while in 23 primary cases treated with mercury and observed for twelve months, 21 developed secondary symptoms. As regards the Wassermann reaction, 16 per cent were positive four to seven months after treatment with salvarsan, 57 per cent five months after treatment with mercury. Five cases of reinfection occurred among cases treated with salvarsan. The routine treatment recommended is an initial intravenous injection of 0·6 gram salvarsan, then nine weekly intramuscular injections of mercurial cream, lastly another injection of salvarsan. The blood is examined every three months, and if the reaction is positive the above course is repeated. These workers have had no deaths and no cranial paralyses in upwards of [illegible] cases. They attribute nervous symptoms to syphilis and not to the neurotropic action of salvarsan, and consider that most deaths have been due to faulty technique or disregard of contraindications. In the fatal cases where epileptiform convulsions and coma occurred, they do not accept Ehrlich's explanation that the symptoms are due to liberation of endotoxins from spirochætes in the meninges, because these cases generally followed the second and not the first injection. They think rather that the effect is due to the cumulative effect of arsenic in susceptible persons. This view is supported by the production of similar symptoms in rabbits by overdosing them with salvarsan, in which cases spirochætes were out of the question. As regards neo-salvarsan, these observers consider it less suitable than salvarsan owing to its instability.

Neisser[21] discusses the changes which have taken place in the treatment of syphilis since 1902, when the following principles were laid down: (1) General treatment should be begun as early as possible; (2) The treatment should consist in several repeated courses of mercury, sometimes energetic, sometimes mild; (3) It should be continued for at least four or five years in all cases of syphilis, even in absence of symptoms; (4) Whenever possible, local treatment should be added, especially in contagious lesions of the skin and mucous membrane. The first principle holds good, for the value of early general treatment has been confirmed by experiments on animals, and by the discovery that general infection of the body takes place at an early period after infection. As a rule, early treatment should depend on the certain diagnosis of syphilis, but in some cases Neisser recommends it even when this is uncertain; for example, in married men and in those about to be married, because on the one hand there is a good chance of cure, and on the other hand serum diagnosis will show in later years whether syphilis is present or not.

As regards the "chronic intermittent" treatment formerly advocated, Neisser considers that it should be chronic but not intermittent. Although symptoms may disappear and the reaction become negative after a single course, relapses with a positive reaction may occur after a year's interval. Therefore the treatment should not be omitted for any length of time. The arguments against the intermittent plan are the facts that the best results are obtained by treatment in the early stages, and that spirochætes may become encapsuled during the intervals. Hence treatment should be fairly continuous during the first year or two. Neisser does not place much reliance on the body's power of resistance, and advises energetic treatment with antispirochætal drugs. As to the duration of treatment, Neisser considers this question still unsettled, although the Wassermann reaction is of assistance. He thinks a positive reaction an indication for further treatment, while repeated negatives suggest a cure but are not conclusive. In order to prevent tabes and general paralysis, the cerebrospinal fluid should be examined, for this may show serological, microscopical, and chemical changes in the absence of clinical symptoms. As regards the therapeutic measures, Neisser advises **Salvarsan, Mercury**, and **Iodides** in all cases, together with **Hydrotherapy**, any contraindications being observed in each patient. Local treatment should include dissection of the primary sore.

Finger[22] considers that neither mercury nor salvarsan has any direct antiparasitic action, and that their effect is indirect by stimulating the production of protective substances. He concludes that salvarsan is useful in combination with mercury in primary cases with a negative Wassermann reaction, and also in tertiary syphilis when rapid action is required, but that in primary cases with a positive Wassermann, and in the early secondary stage, it is best omitted, owing to the danger of hæmorrhagic encephalitis. He points out that the future of patients treated with salvarsan, as regards parasyphilis (tabes, aortitis, and general paralysis), remains to be seen.

Corbus[26] recommends intravenous injections of salvarsan combined with mercurial inunction, and continuous treatment for at least nine months after the Wassermann reaction is negative. Touton[27] adopts the same treatment in most cases of syphilis, and says that tabes, leucoplakia, aortitis, and general paralysis are benefited by it. In cases of cerebrospinal syphilis and in "neuro-recurrences," which he regards as syphilitic in nature, Dreyfus[28] advises energetic combined treatment. For this purpose he gives intravenous injections of 0·4 to 0·5 gram salvarsan, and twelve calomel injections of 0·05 gram during a course of six to eight weeks, the total amount of salvarsan being 5 to 6 grams. Kilroy[29] reports good results with two to four intravenous injections combined with mercurial treatment in these cases at the Royal Naval Hospital, Plymouth. Kren[30] concludes that salvarsan is especially valuable in primary, tertiary, and hereditary syphilis, less so in secondary syphilis, and unfavourable in tabes and general paralysis. He considers high arterial tension, severe nervous affections, and non-syphilitic disease of the middle and internal ear to be contraindications. Antoni[31] reports seven cases of reinfection (fresh primary and secondary syphilis) after treatment with salvarsan and mercury.

Klausner[32] remarks that salvarsan cannot replace mercurial treatment, and that an active preparation of mercury is an essential adjunct to treatment by salvarsan. He recommends a preparation devised by Richter[33] and termed "**Contraluesin**," which consists of a mixture of sozoiodolate of mercury, quinine, and salicylic acid, the mercury being in such a finely divided state that it can enter directly into the blood-stream. This is given by intramuscular injection in doses of 0·15 gram mercury every five days. The syringe must be all glass, without metal, on account of amalgamation with the mercury. Syringe and needle must not come in contact with water, and should be kept in spirit soap. Klausner reports good results in cases of primary, secondary, and tertiary syphilis.

Kolle,[34] by experimenting with various mercurial preparations on the spirilloses of fowls, concludes that the best preparation for combined treatment with salvarsan is **Mercury-sulfamino-dimethyl-phenyl pyrazolon**. Arbour Stephens[35] reports six cases of syphilis, one primary and five tertiary, in which the ulcers healed after subcutaneous injection of 6 to 10 c.c. of **Distilled Water**. He attributes the result to the production of antibodies by diminution of surface tension in the body fluids caused by the distilled water, and compares the results obtained with distilled water with those obtained by salvarsan. He regards the Wassermann reaction as a roundabout way of determining the surface tension at which hæmolysis occurs.

Rajat[36] recommends *rectal administration of salvarsan*. The rectum is first washed out with water. The dose of salvarsan is dissolved in 120 c.c. of artificial serum in the proportion of 5 per 1000, with the addition of soda if necessary for complete solution. The salvarsan enema is retained for thirty-six to forty-eight hours. After experience with 124 cases the author maintains that the effects obtained are the same as after intravenous injection, and that the rectal route is free from the dangers of other methods.

Dudumi[37] concludes that **Hectine** alone is sufficient to heal cutaneous syphilides and gummata, whether ulcerated or not, without the aid of other treatment, but that mercury and iodides should be administered after these lesions are healed. The drug is given by daily intramuscular injection of 0·2 cgram; from five to twenty-five injections in all. The author thinks that hectine compares favourably with salvarsan, and is free from the dangers and complications which are associated with the latter drug. He considers that it is useful in all stages of syphilis, but that it cannot replace mercury.

Jeanselme and Vernes[38] state that syphilis can be aborted or sterilized by salvarsan in the primary and early secondary stages. In 16 cases of primary syphilis secondary symptoms were absent during periods of observation ranging from five to nineteen months, 8 cases being observed for more than a year. In 6 cases treated in the early secondary stage, there were 3 failures, 2 successes which remained free from further symptoms for eighteen and nineteen months respectively, and 1 case in which reinfection occurred. The number of injections was from two to six, usually five or six. The doses were 0·3 gram for the first and 0·4 to 0·5 gram for the subsequent injections, occasionally 0·6 gram. The total amount of salvarsan required for sterilization was estimated at 2 grams. These observers attribute failure of abortive treatment to insufficient dosage, and remark that it is better not to use salvarsan at all than to use it too timidly. L. Bing, on the other hand, does not believe that syphilis can be sterilized by salvarsan, even by repeated injections in the early stages. In 10 cases of primary syphilis, with chancres dating from three to fifteen days, treated with two to seven intravenous injections of 0.4 to 0·6 gram of salvarsan or 0·45 to 0.75 gram neosalvarsan, secondary syphilis followed in all but 3, and in these the Wassermann reaction remained positive.

Wansey Bayly[39] discusses the *dangers and complications of salvarsan injection*. He considers that there is still a risk to life, but that this is very small. He groups the fatal cases under four headings, those with symptoms of (1) meningitis, (2) nephritis and uræmia, (3) toxæmia associated with hepatic degeneration, (4) pulmonary embolism. In most cases the symptoms have occurred after the second dose of salvarsan. Both acute nephritis and fatty changes in the liver-cells have been produced by experimental arsenical poisoning, and similar effects may be due to toxic doses of salvarsan. Bayly is of opinion that deaths occurring under the first three headings are the result of a cumulative action, and that some patients are especially susceptible to salvarsan. As regards complications, the most dangerous are due to the toxic action of the drug, especially on the meninges. As a sign of toxic action he mentions conjunctivitis, which is an early sign of intolerance. He does not think there is any danger to the optic nerve. He attributes fever in some cases to impurities in the saline solution, in others to liberation of endotoxins from destroyed spirochætes. In order to avoid complications, Bayly recommends: (1) Lowering the blood-pressure, so as to accommodate the extra amount of fluid, by giving a pill the night before and a saline purge the morning of injection, and by withholding food and drink for five hours; (2) Fresh preparation of solution immediately before use; (3) Rest in bed for twenty-four hours after; (4) The drinking of large quantities of barley-water and a milk diet for twenty-four hours; (5) Absolute rest of limb in case of phlebitis to avoid pulmonary embolism; (6) Intervals of a week between the injections.

Mouneyrat[illegible] has invented two new arsenical compounds which are said to be as effective as salvarsan on spirochætes and trypanosomes, and free from the neurotropic and congestive action of this preparation. These compounds are called **Galyl** and **Ludyl**, the former being tetra-oxydiphosphaminodiarsenobenzene, the latter phenyldisulfamine-tetraoxydiaminodiarsenobenzene. Experiments on animals showed a marked action on *Trypanosoma gambiense*, the spirilla of African recurrent fever, and those of the spirillosis of fowls. In human syphilis remarkable results were obtained in 220 cases. Chancres healed in from two to twelve days, and cases treated in the primary stage remained free from secondaries. Mucous patches, erosive and papular syphilides healed in a few days, and gummatous infiltrations in ten to twenty days. The Wassermann reaction usually became negative. These drugs may be given by intramuscular injections of an oily suspension containing 20 to 30 cgrams, or by intravenous injections of a solution in distilled water in doses of 40 to 50 cgrams for a woman and 45 to 60 for a man. Three weekly injections are usually enough. The injections are said to be well tolerated, and no albuminuria or affections of the optic and auditory nerves were noted.

Tsuzuki[illegible] has used a combination of tartrate of potassium and ammonium with oxide of antimony which he terms "**Antiluetin.**" This is given according to the formula: Antiluetin 2·5, cocaine hydrochlorate 0·5, distilled water 100 grams; 1 to 2 c.c. for a dose. Cocaine is added because the injection is painful. It is made subcutaneously between the shoulders, beginning with a dose of 0·025 gram, and gradually increasing to 0·1 gram, till a total of [illegible] gram is given during [illegible] days. Tsuzuki reports good results with antiluetin, whether alone or in combination, in primary, secondary, and tertiary syphilis, including a case of cerebral syphilis and one of optic atrophy.

Bruck and Gluck[12] report good results with intravenous injections of **Cyanide of Gold and Potassium,** in doses of ·01 to ·03 gram. The effect in tertiary syphilitic ulceration is said to be nearly as rapid as with salvarsan.

Bernard[13] has tried the following intensive treatment in five cases of secondary syphilis which were observed for about two years, no further symptoms appearing and the Wassermann reaction remaining negative. The scheme of treatment was, for the first three days, 60 gr. of potassium iodide daily; fourth day, cathartics and Turkish bath; fifth day, intravenous injection of ·6 gram salvarsan; sixth and seventh days, rest; eighth to twenty-second day, intravenous injections of mercuric chloride daily, beginning with $\frac{1}{5}$ gr. and rapidly increasing the dose to the maximum; twenty-third to twenty-sixth day, 60 gr. of potassium iodide daily; twenty-seventh day, cathartics and Turkish bath; twenty-eighth day, salvarsan as before; twenty-ninth and thirtieth days, rest; thirty-first to forty-eighth day, mercuric chloride injections as before.

McMurtry[14] remarks that although salvarsan is a remedy with remarkable action, the use of mercury is still universal. He believes, therefore, that any measure is valuable which tends to make intense mercurial medication safer and more effective. For this purpose he advocates **Sulphur,** either in the form of natural sulphur waters or as precipitated sulphur. Sulphur aids the absorption of mercury, and also its elimination, and hence tends to prevent mercurial poisoning. According to McMurtry, sulphur is indicated (1) In intensive mercurial treatment; (2) When the assimilation or elimination of mercury is deficient; (3) As a routine treatment after a course of mercury; (4) In habituation to mercury, when the tissues have lost their power to react to the drug and may be "resensitized" by sulphur; (5) In malignant, obstinate, or constantly recurring lesions; (6) When encapsuled masses of mercury are left after intramuscular injections of insoluble preparations; (7) In intolerance to mercury; (8) In syphilitics who suffer from anaemia, gout, rheumatism, cachexia, and debility; (9) In mercurial poisoning; (10) In intolerance to iodides. The contraindications are said to be pregnancy, hepatic disease, visceral congestion, arteriosclerosis, severe nervous disease, active tuberculosis, and gastric intolerance.

Congenital Syphilis. (*See also* SYPHILIS, CONGENITAL.)—Levy-Bing and Duroeux[15] recommend a varied treatment in syphilitic sucklings. Mercury and arsenic are indicated in general eruptions, mercury and iodide in infiltrated lesions, and also in congenital dystrophies. **Mercury** is well tolerated by infants, provided the liver and kidneys are sound. It may be given: (1) By inunction in the form of equal parts of metallic mercury and benzoated lard, 1 gram being rubbed in daily into various parts of the body; (2) By the mouth, in the form of Van Swieten's liquor (1-1000 alcoholic solution of mercuric chloride), given in gradually increasing doses of 10 to 15 drops in the first week and 30 or 40 drops in the fourth week, up to 4 or 5 grams at the end of a year, also in the form of grey powder. (2) By injections in the form of biniodide of mercury (biniodide of mercury and potassium iodide 1 gram of each in 100 c.c. of distilled water), or benzoate (1 gram in 100 c.c. of isotonic serum) in doses of ½ mgram per kilo of body weight, injections being made daily into the buttocks in series of fifteen. In older children, insoluble injections of calomel or grey oil may be used. As regards **Iodide of Potassium**, ·05 to ·15 gram may be given daily during the first year when indicated. They are not in favour of salvarsan in the case of infants.

Simpson and Thatcher,[46] on the other hand, report good results from salvarsan treatment in forty cases of congenital syphilis varying in age from a month to eleven years. The method used was that of direct injection into the external jugular vein after cutting down on it. The dose was ·01 gram per kilo of weight. Rapid improvement was obtained in cutaneous eruptions, onychia, epiphysitis, enlarged spleen and liver, cervical adenitis, synovitis of the knees, keratitis and irido-cyclitis, and gummata. There were seven deaths, six in children under six months old; two had severe syphilitic pemphigus, one was marasmic, two died later of broncho-pneumonia and one of convulsions; one death was perhaps due to impure distilled water. The remaining 33 cases did well. The authors conclude that salvarsan can be given safely to the youngest child with proper dosage and technique. In severe cases, such as those with bullous syphilides or marasmus, the dose should be less than ·01 gram. They advise mercurial treatment in addition, but mention that some cases did well with salvarsan alone. They do not regard the Wassermann reaction of much use as an index of the efficacy of treatment.

Treatment of Syphilis in Pregnant Women.—At the Fifteenth Congress of the French Obstetrical Society,[47] this subject was discussed. Sauvage reported on 130 cases. He first drew attention to the action of **Salvarsan** on the liver and kidney. Reducing substances and sugar may be present in the urine, possibly due to the excretion of salvarsan. Albuminuria may be intense, but may disappear with appropriate diet. Jaeger reported severe nephritis and Gaucher a fatal case. Bar described a case which died of hæmorrhage into the central nervous system after injection of neo-salvarsan. Salvarsan is indicated during pregnancy when other treatment is insufficient. It is contraindicated in all cases where careful examination of the patient may foreshadow a possibility of accidents. These may be due to arsenic or to toxins liberated by destruction of spirochætes. The excretion of arsenic depends on the integrity of the liver and kidneys, and is more rapid with salvarsan than neo-salvarsan. Excretion of arsenic may be less than the quantity injected; hence great prudence is necessary in the administration of salvarsan during pregnancy. It does not appear to raise arterial tension, but because of the accidents which may accompany hypertension it is best avoided in pregnant women who have a high blood-pressure. The action of salvarsan on the spirochætes is generally rapid, but after an insufficient dose these may reappear in the lesions. The action on the Wassermann reaction is variable and inconstant, and may be transitory. In a case reported by Bar, the reaction remained positive after five injections of salvarsan and eight of neo-salvarsan. The contradiction which may exist between the clinical symptoms and the Wassermann reaction renders the action still more uncertain.

The passage of salvarsan to the fetus has been denied by several observers, but others have found arsenic in the blood of the umbilical cord a few days after the injection. The Wassermann reaction often differs in mother and child, and is generally more positive in the latter. As regards the effect of salvarsan on labour, analysis of 84 cases showed that labour was precipitated only in three, and those near term. On the contrary, salvarsan seems to favour the evolution of pregnancy, since in these 84 cases, 38 were delivered at term, 32 in the ninth month, and 12 in the eighth. The action on primary and secondary lesions of the mother is rapid, but these lesions may recur during or after pregnancy. The fetus appears to be affected by injection of salvarsan, for three cases of death in utero have been published; this danger, however, seems to be small. On the other hand, salvarsan appears to protect the life of the infant against maternal infection during intra-uterine life, for out of 91 infants, 84 were born alive (92 per cent); but a certain number of infants born apparently healthy after treatment of the mother with salvarsan during pregnancy are potentially syphilitic, and it is impossible to estimate the proportion. Therefore, all such infants should be treated after birth, and should never be given to a wet-nurse.

Sauvage next considers **Mercurial** treatment during pregnancy. For this purpose he has collected the statistics of Pinard, Champetier de Ribes, Boissard, and Potocki. In the first group the women had active syphilis during pregnancy and were submitted to mercurial or mixed treatment. In 133 out of 217 cases, or 61 per cent, this was incapable of healing active syphilitic lesions. In 74 per cent of these cases the child was born dead or died soon after birth; 10 per cent were born with signs of syphilis. In a second group there were no signs of syphilis during pregnancy. Mercurial or mixed treatment was given during pregnancy, and irregularly before fecundation. Out of 103 cases of this kind, 66 infants were born alive with no signs of syphilis at birth, 14 per cent had signs of syphilis at birth or soon after, and 10 per cent were born dead or macerated. The third group comprises cases with no symptoms during pregnancy, but with regular mercurial treatment before fecundation and during pregnancy. In 128 cases of this kind, there were 88 per cent living infants. Hence mercurial treatment, to be most successful, requires to be prolonged. It should be commenced at least six months before conception, and continued during pregnancy.

Salvarsan is only indicated in cases where the woman has not received regular treatment before fecundation, and in cases of active syphilis during pregnancy, whether due to recent infection or relapse of former syphilis. In such cases it gives results where mercury has failed. Also, the 92 per cent of infants born alive after salvarsan compared with the 74 per cent born dead after mercury is in favour of the former treatment, in cases of active lesions during pregnancy. When the woman has no active signs, but has not received regular treatment before conception, Sauvage thinks that salvarsan should be used with prudence, if at all. The two deaths reported above were under these conditions, and with mercury 66 per cent of infants were born alive under the same conditions. The Wassermann reaction cannot be depended upon as a guide, and clinical examination is still, and should remain, the only indication for treatment. Before administering salvarsan, the patient should be examined for any contra-indications, especially insufficiency of the liver and kidney, and idiosyncrasy to arsenic. The doses should be small and frequent, and the excretion of arsenic should be tested regularly. However, good results have been obtained after a single injection of salvarsan followed by mercurial treatment. Lastly, treatment should be begun as near as possible to the commencement of gestation, before the spirochætes have caused severe visceral lesions in the fœtus.

Chambrelent analyzed the results of salvarsan treatment on the infant, including indirect treatment through the mother or with the milk of a goat injected with salvarsan, and direct treatment of the infant. In 51 cases of indirect treatment through the mother, 27 were improved, 24 were not improved or relapsed, and 8 died. It is impossible to say whether the deaths were due to disease or treatment. The mechanism of this treatment is doubtful. The quantity of salvarsan excreted in the milk is uncertain. Some observers think that the effect is not due to arsenic, but to antibodies formed in the mother which pass to the infant by the milk; but, as Chambrelent points out, if this is the case the effect can only be transitory, for the syphilitic antibodies must be incapable of killing all the spirochætes in the infant. However, he thinks that the indirect method should not be abandoned, but should be reserved for cases where the mother has active lesions which may be benefited by salvarsan. As regards the direct method, Chambrelent collected 38 cases in 1910, 25 of which were improved and 13 died; but in 1911, when the technique had been improved, the total of cases published gave 55 improved and only four deaths. In 1912 numerous cases were published: Engelmann reported seven cases with 3 deaths but the doses were too large; Welde, 28 cases (subcutaneous, intramuscular, and intravenous injections), with 2 deaths due to other causes; [illegible] and [illegible], 18 cases with 4 deaths (intravenous injection of 8 mgrams per kilo repeated several times up to 4 cgrams per injection); Scother, 10 cases with good results with subcutaneous injections of 1 cgram per kilo. Chambrelent concludes that direct injection of the infant appears to be the best method, but it must be used with great caution. It is indicated when the infant presents severe cutaneous lesions, and when mercurial treatment has failed. He considers intravenous injection dangerous, and subcutaneous or intramuscular injection preferable, especially since the introduction of neo-salvarsan. The dose should be from 10 to 15 mgrams per kilo of weight.

Fabre and Bourret consider that the indications for intravenous injection of women with no symptoms, with the object of prophylactic treatment of the infant, are very restricted, and limited to failure of mercurial treatment during previous pregnancy and intolerance of mercury; but when active symptoms are present in the mother, they think that salvarsan is more often indicated. They limit the dose to 0·3 gram. These observers also report on 20 cases of intramuscular injection of infants. Neo-salvarsan is more easy to inject, and is less liable to cause induration and muscular necrosis. Three cases died, but they only attribute this result to the drug in one case, which developed hæmaturia and died in ten days after an injection of 2 cgrams. In all the other cases the results were good, especially in syphilitic pemphigus. When the infant is heredo-syphilitic but has no active lesions, the benefit derived from salvarsan is doubtful, and it seems to have little effect on the general condition. Moreover, its action on the lesions is only transitory, and recurrences are frequent. Hence, treatment must be continued by mercury and iodides. Salvarsan injection should only be repeated when lesions reappear in spite of mercurial treatment. These observers are therefore in favour of combined treatment by salvarsan and mercury.

Lemeland and Brisson report the results of 52 cases of pregnant women treated by salvarsan and neo-salvarsan. They conclude that salvarsan has no effect on the course of labour; that it has a favourable effect on the fœtus, that the doses should be small (below 0·5 gram); that a second injection should not be given unless the elimination of arsenic is normal after the first injection; that neither salvarsan nor neo-salvarsan in non-dangerous doses renders the Wassermann reaction definitely negative; that the action of salvarsan and neo-salvarsan on the fœtus appears certain, but neither of these drugs is without danger; that the action on the infant is variable, and dangerous in severe infections; that neo-salvarsan is more dangerous than salvarsan; that these two drugs may favour syphilitic infection of the nervous system; finally, that the difficulties of preparation, the necessity of estimating the excretion of arsenic, and the dangers connected with this treatment, render it an exceptional and not a routine form of treatment.

Bar finds that salvarsan does not cure syphilis and seems to predispose to neuro-recurrences. Salvarsan is a powerful remedy but a dangerous one, and it is doubtful whether the dangers are avoided by smaller doses. He considers it necessary to estimate the excretion of arsenic, and, if it is arrested, to abstain from repetition.

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SYPHILIS, CEREBROSPINAL. (*See also* CEREBROSPINAL FLUID.)

Purves Stewart, M.D., F.R.C.P.

Dementia Paralytica.—The DIAGNOSIS of general paralysis in its earlier stages has, within the last few years, made notable advances, mainly owing to a systematic examination of the cerebrospinal fluid in suspected cases. The clinical signs which should lead the physician to suspect general paralysis, and to apply laboratory tests to the blood and cerebrospinal fluid, are discussed by Geo. M. Robertson[1] in his masterly Morison lectures of 1913. When clinical and laboratory tests are thus combined, "there are only two other conditions in which there is any uncertainty with regard to the presence of general paralysis, namely, when mental symptoms exist in connection with its twin-sister, tabes, or its first cousin, cerebrospinal syphilis."

In the early stages of general paralysis, the patient is not insane: he is merely a changed man. There is an alteration in his intelligence, character, habits, and feelings, and this change is for the worse. Forgetfulness is usually a noticeable symptom, and the habits of social courtesy, of decent behaviour, and of personal honour, may be departed from, all of these early symptoms being traceable to a loss of the finer feelings and to impairment of memory. Although, at this stage, the symptoms do not amount to actual insanity, nevertheless they indicate a serious deterioration of intelligence, and, if associated with the physical signs of general paralysis, to be mentioned presently, should not be overlooked. These occasional mental failings may be present for a year or more before serious and continuous signs of certifiable mental disorder become superadded. Many a case of early general paralysis is regarded as merely neurasthenic or, at most, melancholic. But in the melancholia of early general paralysis there is always something atypical. Thus, for example, the patient may eat ravenously, or sleep soundly, or make silly remarks, or show great loss of memory, none of which are typical of common melancholia.

For the diagnosis of general paralysis it is important to bear in mind the combination of mental symptoms with physical signs. The disease should be recognized long before the grandiose delusions of the second stage have supervened. The physical signs that should lead us to suspect early general paralysis are, generally speaking, those also found in tabes dorsalis, with or without certain additional occurrences forming no part of the tabetic syndrome, e.g., a convulsive seizure, temporary aphasia, or an attack of unconsciousness. The *pupils* are usually unequal (although mere inequality by itself, unless very marked, is of little diagnostic value). Their outline is frequently irregular, but the most important pupillary sign is the well-known Argyll-Robertson phenomenon, or complete loss of the light reflex with preservation of contraction on voluntary accommodation. The light reflex should be tested not only by direct illumination of each pupil in turn, but also by the consensual method, which is performed by holding open the lid of one eye and watching the pupil of that eye attentively, whilst with the other hand the other eye is alternately opened and closed. This applies a feebler stimulus to the eye under observation, and loss of this indirect or consensual reflex is often observed in the early stage of the Argyll Robertson pupil when the direct reflex is still preserved. Either exaggeration or loss of *knee-jerks* may occur in early general paralysis. Exaggeration of deep reflexes occurs in too many other conditions to be pathognomonic by itself. Loss of the knee-jerks, and still more so, loss of the ankle-jerks, is highly suggestive of tabo-paralysis.

Articulation should also be tested by asking the patient to repeat catch-phrases, such as "hopping hippopotamus" or "British Constitution," several times in rapid succession. The general paralytic may either repeat a syllable several times over, or he may slur the syllables together. The face loses its normal play of expression comparatively early, even before the occurrence of facial or lingual tremors.

If some, but not necessarily all, of the foregoing physical signs be present, and associated with mental symptoms, such as failing memory, impaired judgment, or moral laxity, and especially if these occur in a man of middle age who has had syphilis ten or fifteen years previously, general paralysis should be suspected, and the blood-serum and cerebrospinal fluid submitted to laboratory tests forthwith.

First, about 5 c.c. of *blood* withdrawn by venepuncture should be examined for the Wassermann reaction. In 99 per cent of cases of general paralysis this reaction is positive. A negative reaction therefore almost certainly excludes general paralysis. If any doubt still exists, the cerebrospinal fluid should be similarly examined. A negative Wassermann reaction in this will exclude general paralysis, in spite of the clinical symptoms. Should the blood yield a positive Wassermann reaction, this means that latent syphilis is present, and *lumbar puncture* should always be performed. If the reaction in the fluid then proves to be negative, the case is probably not one of general paralysis but of mental symptoms in a syphilitic patient, possibly due to cerebral syphilis. If the reaction be positive in the spinal fluid as well as in the blood, there are three possibilities: (1) General paralysis, the most probable; (2) Tabes with mental symptoms; (3) Cerebrospinal syphilis with mental symptoms. A positive reaction in the cerebrospinal fluid is a paramount sign, pointing to one of the foregoing three diseases.

The next step is a cytological examination of the spinal fluid. Lymphocytosis occurs in general paralysis, tabes, and cerebrospinal syphilis. In these diseases we also find an excess of globulin by the Nonne-Apelt test, also an excess of over 0·1 per cent of albumin by Aufrecht's albuminimeter. The presence of plasma-cells in the cell count is highly suggestive of general paralysis.

How are we to distinguish between tabo-paralysis and a case of tabes with mental symptoms not due to general paralysis? This is sometimes a matter of considerable difficulty. The signs of mental weakness and loss of memory in which the deterioration is progressive, are especially suspicious of general paralysis, more particularly if articulatory difficulties are also present. Cerebrospinal syphilis with mental symptoms may simulate general paralysis so closely as to make a differential diagnosis impossible during life. Most of the supposed recoveries from general paralysis, as Robertson points out, have really been cases of cerebral syphilis. The mental symptoms do not help materially in distinguishing the two conditions, and more weight must be placed on the physical signs. These are more definitely localized in cerebral syphilis; also they appear more suddenly and are more permanent than similar signs in general paralysis. Lastly, antisyphilitic treatment by mercury, iodide, or salvarsan, usually benefits cerebral syphilis, but is unavailing in general paralysis.

This remarkable failure of the most energetic antisyphilitic remedies led many workers to the hypothesis that general paralysis was not a true syphilitic disease, but a so-called meta- or para-syphilitic malady, due not to the spirochæte itself but to some other poison to which the syphilitic organisms predisposed the patient. To this theory the almost invariable positive result of the Wassermann reaction in the blood and cerebrospinal fluid was always an objection, and both Wassermann and Ehrlich maintained that the spirochæte must still be present in the nervous system, although they themselves had not been fortunate enough to discover it. The final link in the chain of evidence was furnished in the end of 1912 by Noguchi,[2] who demonstrated the existence of spirochætes in the cerebral cortex of about 20 per cent of general paralytics examined by him. This epoch-making observation, which definitely classes general paralysis as a true syphilitic disease, renders still more remarkable its absolute intractability and resistance to all ordinary antisyphilitic remedies. Ehrlich[3] suggests as a possible explanation that in general paralysis, which, as is well known, develops many years after the original infection, there is a strain of surviving spirochætes with special biological peculiarities widely different from those of the organisms which produced the original disease, and that together with this biological difference, there is a special resistance to therapeutic agents. It is also possible, as suggested by Westphal,[4] that as a result of special conditions of nutrition and circulation in the brain therapeutic agents cannot reach the surviving spirochætes in sufficient quantity or with sufficient intensity to destroy them. He points out that the spirochætes in the general paralytic brain are singularly scattered in the deeper layers of the cortex, burrowing among the nerve cells, and that, as a rule, they are at some distance from the vessels. Stoll has made the attractive suggestion that the meninges and adventitial vascular coats, in the general paralytic brain, form a wall of resistance to infiltration cells, and that it is this diminished meningeal permeability which prevents the ordinary antisyphilitic remedies from reaching the spirochætes. The practical conclusion, as regards antisyphilitic treatment of general paralysis, would be either to increase the permeability of the meninges, or to search for some more permeable remedy, either amongst the arsenical group, as Ehrlich suggests, or elsewhere. Noguchi[1] has also succeeded in producing typical syphilitic sclerosis in the rabbit's testicle by inoculation with a fresh brain emulsion from a case of general paralysis. In any case, Noguchi's observations on the brain encourage us to persevere with fresh attempts in the treatment of this disease, now that we know it to be not merely a sequela but an active syphilitic malady. But before accepting any remedy as efficient, we must bear in mind the fact that spontaneous remissions are not uncommon in general paralysis, so that prolonged and carefully controlled observations will yet be necessary before it can be claimed that general paralysis is actually curable.

TREATMENT.—Have recoveries ever taken place? No satisfactory answer can yet be given to this question. It is well known that remissions not infrequently occur in this disease, their duration varying from six to twelve months, and in rare cases lasting four or five years. Such remissions may occur spontaneously. They may also be associated with the repeated production of artificial pyrexia, whether by injection of **Tuberculin** (Wagner), or of **Sodium Nucleinate** (Donath). (See MEDICAL ANNUAL, 1913.)

George Robertson devised the following treatment, which aims at introducing into the cerebrospinal fluid a serum highly charged with syphilitic antibodies. An intravenous injection of **Salvarsan** in moderate amount (0·3 to 0·6 gram for an average man) was given at intervals of about a month. In the intervals between the salvarsan injections antisyphilitic serum was injected intrathecally, a corresponding quantity of cerebrospinal fluid being previously withdrawn. The serum was prepared as follows: A patient suffering from secondary syphilis was given a full intravenous dose of salvarsan. Three days later, when the blood was presumably full of syphilitic antibodies, 20 or 30 c.c. of blood were withdrawn aseptically by venepuncture. This was allowed to clot, and the clotted blood was left on ice for about twenty-four hours whilst cultures were made from the serum to ensure its sterility. If sterile, it was gently poured into a sterile flask with other antisyphilitic sera. From 10 to 15 c.c. of this mixed serum, twenty-four or forty-eight hours old, was used for injection. In other cases serum was obtained from the general paralytic patient's own blood, an hour after he had received an intravenous injection of salvarsan. The serum was collected and treated as above, but was injected before the serum was twenty-four hours old, and in smaller doses, 3 or 4 c.c. Whilst the patient was undergoing this treatment he received full doses of urotropin (10 gr. thrice daily), since this drug is known to be excreted into the cerebrospinal fluid, and, even by itself, has been reported to produce improvement in general paralysis.

The results of this treatment, as recorded by Robertson, are admitted to be inconclusive. In all he treated twelve cases, and states that seldom did it happen that a patient did not show some slight improvement in his symptoms after the first or second injection. Five cases showed considerable excitement followed by definite improvement. Three cases recovered sufficiently to be discharged from the asylum. Of these three, one relapsed in six months, another several months after discharge met with a fatal accident at home, while the third has remained well for a year. In none of these cases did the Wassermann reaction in the spinal fluid become negative, although some showed temporary diminution in its intensity. In one fourth of the cases there was marked diminution of the lymphocytosis, and in another fourth it was slight and transient. Roughly speaking, this means that in one half of these cases there was evidence of improvement in the cerebrospinal fluid. Robertson himself points out that the foregoing results are insufficient to show whether we have to do with mere remissions or with an actual curative process. He inclines to the opinion that the treatment was not vigorous enough, either as regards the amount of salvarsan administered, the number of the injections, or the rapidity with which these succeeded one another.

At the recent International Congress in London in 1913, during a discussion upon the "parasyphilitic" diseases, tabes and general paralysis, the present unsatisfactory position of therapeutics of these diseases was referred to by numerous speakers. Despite the undoubted fact that both tabes and general paralysis are syphilitic in origin, the fact remains that ordinary antisyphilitic treatment, whether by mercury, iodide of potassium, or salvarsan, has little or no effect. It has been suggested that the reason for this may be that mercury and salvarsan cannot pass through the choroid plexus into the cerebrospinal fluid, so as to exercise their effects upon the nerve tissues bathed in that fluid. The injection of mercurial or arsenical preparations directly into the cerebrospinal canal through a lumbar-puncture needle would be highly dangerous, inasmuch as the drug so injected, in order to kill the spirochætes, would at the same time prove fatal to the patient. The ideal treatment, therefore, is one which will either diffuse through the choroid plexus when introduced into the general circulation, or one which can be directly injected into the cerebrospinal canal.

In this connection an interesting communication was made at the Congress by Swift, from the Rockefeller Institute in New York. The method of treatment, broadly speaking, is similar to that of Robertson

The patient is given an ordinary dose of salvarsan or of neosalvarsan intravenously. An hour later when the drug is already well diffused through the system, a quantity of blood is withdrawn by venesection. This blood is centrifuged, in order to get rid of all cellular elements, since red corpuscles, if introduced into the cerebrospinal fluid, merely undergo hæmolysis, and may produce deleterious effects. The serum is then diluted to a 40 per cent mixture by the addition of normal saline solution. The mixture is heated at a temperature of 56° C. for half an hour. This not only renders it sterile, but increases its bactericidal effect. Next day a lumbar puncture is performed, and the cerebrospinal fluid is allowed to escape until its pressure falls to 30 mm. of cerebrospinal fluid. A 30-c.c. glass syringe is then attached to the lumbar puncture needle by means of a piece of sterilized rubber tubing 40 cm. in length. The diluted serum is now allowed to flow into the cerebrospinal canal by gravity, not by pressure; 30 c.c. or more of the mixture are injected. This process is repeated about every two weeks. Sometimes a reaction is observed, consisting in some local pain with slight fever, but this is inconstant. In most cases the patient's own serum is used for injection, but sometimes the serum of other patients treated by salvarsan is employed.

Swift related the results of thirty-two tabetic cases thus treated. In four the cerebrospinal fluid became normal, having lost its cells, its globulin, and its Wassermann reaction. In 40 per cent of cases the Wassermann reaction in the cerebrospinal fluid became negative. In 30 per cent more the reaction diminished in intensity, whilst in three patients, i.e. 10 per cent, it was unchanged. The clinical results were not detailed by Swift.

Salvarsan.—The most brilliant results of salvarsan medication are undoubtedly its effects upon the various syphilitic affections of skin, mucous membranes, and periosteal and bony structures. Compared with these, its results in syphilitic and parasyphilitic diseases of the nervous system are less satisfactory, probably because we have to deal with highly differentiated and delicate tissues which are not only easily and permanently damaged, but in which regeneration is usually impossible and compensating processes occur with much less readiness than in simpler and less specialized tissues.

Straightforward *cerebral or spinal syphilis*, if treated promptly and thoroughly with salvarsan, is usually beneficially influenced. Thus Donath[illegible] records forty-eight cases, including hemiplegia, fits, headache, cranial nerve paralyses, paraplegia, bladder troubles, etc. In only one case of his foregoing series was a mercurial cure superadded. Most neurologists, however, find by experience that the effects of salvarsan treatment are enhanced by **Mercurial** treatment, and the writer is in the habit of giving full doses of mercury, either in the form of perchloride by the mouth, or in severe cases by energetic inunction. It is also a prudent precaution to administer salvarsan in small doses of 0·3 gram intravenously at frequent intervals, rather than in the full dose of 0·6 gram at a single sitting. The results of this treatment are to bring the active syphilitic process to a close, and to permit of the recovery of such nerve-cells and fibres as have not actually been destroyed. It is futile to hope for the cure, say, of a hemiplegia due to an area of softening resulting from the thrombosis of a syphilitic artery. We may remove the gummatous infiltration of the arterial wall, but the secondary thrombotic area of destroyed nerve-tissue remains, permanently damaged.

With regard to tabes and general paralysis the results of salvarsan treatment are different in the two diseases.

In *tabes*, especially if the patient comes under treatment in the early stages of the disease, his symptoms are often ameliorated to a remarkable degree by salvarsan treatment. The lightning pains are specially benefited, and similar results can also be observed after treatment by **Enesol**, another arsenical salt allied to salvarsan. It has the advantage of being suitable for hypodermic administration, and it is therefore worth bearing in mind in cases where intravenous medication by salvarsan is for some reason or other impracticable. Donath records thirty-one cases of tabes treated by salvarsan, apparently, so far as he gives details, by a single dose in each case. Most of them were in the early stages of the disease. Lightning pains were relieved in seven cases, although in one there was a transient exacerbation of pain for two days after the injection, followed by complete relief. Ataxia disappeared in two cases, but became aggravated in a third. Cranial nerve palsies cleared up in two cases. Sphincter troubles also improved in two or three instances. Gastric crises disappeared in two patients. The general nutrition improved in nineteen patients, of whom six showed specially marked improvement and increased in weight. The Wassermann reaction in the blood was estimated in seventeen cases, of which five were negative and eleven positive. In only one case did the reaction become negative under treatment.

In *general paralysis* Donath records twenty-eight cases treated by salvarsan, generally in two doses, sometimes combined with seven or eight injections of **Sodium Nucleinate** (see MEDICAL ANNUAL, 1913, p. 102), and claims to have observed improvement of mental power in nine cases, whilst the general nutrition improved in eighteen. In three cases the pupillary reflex returned, and in eleven the articulation improved. Three patients recovered sufficiently to resume their work. Whether these three cases are to be regarded as cures or simply remissions, time alone can show.

NERVE-RELAPSES ("NEURO-RECIDIVE") AFTER SALVARSAN TREATMENT.

Amongst the incidents of the salvarsan treatment of syphilis, one of the most interesting is the occasional occurrence of symptoms indicating a focal lesion in the central nervous system, even in patients who previously had shown no obvious symptoms of nervous syphilis. These so-called "neuro-recidive," or nerve-relapses, occur almost exclusively in cases where salvarsan has been administered for primary of secondary syphilis. The average time of onset of nerve-relapses is from five to eight weeks after the last salvarsan injection.

Various theories have been suggested to explain the origin of such nerve-relapses. Thus, for example, some have attributed the phenomena to a neurotropic toxic action of salvarsan itself; others have suggested that it induces vascular changes, affording a *locus minoris resistentiæ* to the surviving spirochætes. Both these hypotheses, however, are negatived by the fact that salvarsan exercises a striking curative effect in nerve-relapses. Others, again, suggest that salvarsan, whilst killing the main body of spirochætes in the general circulation, has greater difficulty in reaching certain small foci harboured in parts of the nervous system, and that it may even provoke these survivors to special activity. Others, again, in view of the irregularity of occurrence of such cases in some cliniques and of their relative infrequency in others, have suggested that the technique of the salvarsan injections may have something to do with it. Thus Cronquist[7] is of opinion that the readiness with which salvarsan becomes oxidized may be a factor in increasing its toxicity, especially if the solution be not injected forthwith, but is allowed to stand for some little time. Ehrlich, it will be remembered, instructs the physician to inject the salvarsan solution freshly made. In many cliniques, however, a large quantity of solution is made up at once, and this is divided amongst the various patients who may require salvarsan treatment in the course of one séance. Supposing that at such a clinique twelve patients be injected successively at intervals of about five minutes, it is evident that the solution administered to the twelfth patient may easily become appreciably oxidized. Cronquist, therefore, insists upon the advisability of making up the solution separately for each patient from his own ampoule and injecting it forthwith. Under these conditions he only observed one nerve-relapse, and that a mild one, consisting in transient facial palsy with diplopia, out of 150 injections in eighty patients.

The parts of the nervous system most commonly affected are certain cranial nerves, especially the auditory, facial, and optic nerves, although less commonly, lesions may also occur elsewhere in the central or peripheral nervous system, producing convulsions (local or general), headache, vomiting, giddiness, etc. This special vulnerability of the auditory nerves should be carefully borne in mind, since not infrequently the otologist may detect failure of hearing long before the patient notices any subjective auditory abnormality. The auditory nerve, as Dreyfus[7] points out, is not only the nerve most commonly attacked, but also the most sensitive to the syphilitic poison.

Another point which has become evident to neurologists during the study of such cases is that these nerve-relapses are really syphilitic in nature. Practically all of them, on examination of the cerebrospinal fluid, show the characteristic pleocytosis, together with the excess of globulin, of a syphilitic meningitis, whilst the Wassermann reaction is usually positive, both in the blood and cerebrospinal fluid. Nichols and Hough[9] have demonstrated the presence of spirochætes in the cerebrospinal fluid by inoculation into the testicle of the rabbit. The Wassermann reaction in the blood may become negative under treatment long before the nervous symptoms clear up, whilst the cerebrospinal fluid still shows signs of active syphilitic changes. Hence the importance of examining the cerebrospinal fluid repeatedly in cases of suspected nerve-relapses, and also during the course of their treatment. An abundant pleocytosis not only clinches the diagnosis of cerebrospinal syphilis, but calls for energetic antisyphilitic treatment. As the nerve-relapse clears up, so does the pleocytosis diminish, and so long as a definite pleocytosis remains there is need for further treatment and prospect of improvement.

Regarding nerve-relapses, therefore, simply as varieties of cerebrospinal syphilis which have arisen under special circumstances, their treatment consists in a combination of **Salvarsan** with **Mercury**, controlled by repeated observations on the cerebrospinal fluid. The salvarsan should be administered in small doses at short intervals, whilst the mercury should be pushed to its full extent. The writer gives doses of 0·3 gram of salvarsan, or 0·45 gram neosalvarsan, intravenously once or twice a week, together with inunction by a mercurial cream. The patient must not be considered cured until the Wassermann reaction in the blood is constantly negative and the cerebrospinal fluid is also normal. There is, of course, a limit to which salvarsan can be safely pushed: Dreyfus holds that a total of 4 to 5 grams within a period of five to six weeks is about the maximum safe amount. If more be given, there is a risk of arsenical neuritis. Should the cerebrospinal fluid still show signs of abnormality at the end of such a course, it is prudent to drop the salvarsan for a month and then start again, persevering in the meantime with energetic mercurial inunction. A striking fact in these cases is the improvement in the patient's general health during the course of "intensive" treatment.

A sharp distinction must be drawn between the syphilitic nerve-relapses following salvarsan treatment and another group of cases of true *salvarsan poisoning*. The clinical picture of this latter condition is entirely different, as will be seen by the following case recorded by Assmann.[10]

A man of [illegible] was admitted with a primary sore, in which spirochætes were demonstrated, and with hard bubo but no cutaneous rash. Salvarsan 0·4 gram was given intravenously, together with an intramuscular injection of 0·1 gram of salicylate of mercury. The patient had mild pyrexia in the afternoon, but no headache or vomiting. For the next two days he felt quite well, with normal temperature. On the third day after the original injection he received a second dose of salvarsan, 0·3 gram, together with an intramuscular injection of salicylate of mercury as before. The same afternoon he had fever, nausea, and headache. These symptoms persisted, and on the third day after the second salvarsan injection he developed severe epileptiform fits and mental dullness, the fits recurring at intervals of half an hour. The optic discs, sensory, motor, and reflex phenomena were all normal. The cerebrospinal fluid contained only 1 to 2 lymphocytes per c.mm., but showed excess of globulin. The Wassermann reaction was negative in the cerebrospinal fluid, but positive in the blood. The urine was highly albuminous, with a few red cells in the deposit. Despite full doses of chloral the temperature continued to rise. The patient died comatose, thirty-six hours after the onset of the head symptoms, i.e., five days after his second salvarsan injection. The cerebrospinal fluid withdrawn immediately after death was slightly turbid, and contained 130 cells per c.mm., of which 90 per cent were polynuclears, 2 per cent small lymphocytes, and 8 per cent large lymphocytes. The Wassermann reaction in the fluid was absolutely negative. There was distinct cloudy swelling of the kidneys and liver, no gastric or intestinal abnormality, and no jaundice. All the other organs were normal save the brain, in which there were abundant perivascular capillary hæmorrhages, irregularly distributed in the grey and white matter. Here and there, near the cortex, there were also perivascular infiltrations of polynuclear cells, also around the margin of the large hæmorrhages.

The foregoing description differs in several important details from the common clinical picture of a nerve relapse. First, the cerebrospinal fluid was at first practically normal as regards cell count, save for a slight and insignificant increase of lymphocytes, amounting only to 7 to 8 per c.mm.; later a marked pleocytosis occurred, but, unlike the cases of nerve relapse, this was of a polynuclear variety. There was progressive increase of albumin, and especially of globulin, from the first. These characters are against the syphilitic origin of the changes in the fluid, and, moreover, the Wassermann reaction was negative throughout. We therefore conclude that the changes in the fluid were not syphilitic, but due to acute poisoning, probably arsenical in nature, as evidenced by the changes in the kidneys. It may be incidentally remarked that gastro-intestinal symptoms, which are so constantly present in ordinary arsenical poisoning, where the poison is taken by the mouth, were here conspicuous by their absence. Another point of interest is the fact that there was a free interval of two or three days, during which the patient had no symptoms, before the signs of salvarsan poisoning set in. Lastly, although this is a point on which Assmann lays no stress, but which appears to be of considerable practical importance, the amount of salvarsan injected was its full dose of 0·6 gram on two successive occasions, at intervals of three days. This should teach us caution in the administration of so potent a drug.

References.—[1]*Edin. Med. Jour.* 1913, i, 20, and 428; [2]*Jour. Exper. Med.* 1914, Feb.; [3]*Münch. med. Woch.* 1913, 443; [4]*Berl. klin. Woch.* 1913, 669; [5]*Jour. Amer. Med. Assoc.* 1913, i, 85; [6]*Münch. med. Woch.* 1912, 2276 and 2342; [7]*Ibid.* 2449; [8]*Ibid.* 2238 and 2287; [9]*Jour. Amer. Med. Assoc.* 1913, i, 108; [10]*Berl. klin. Woch.* 1912, 2346 and 2414.

Bedford Pierce, M.D., F.R.C.P.

General Paralysis.—The discovery by Noguchi of the *Spirochæta pallida* in the brains of fourteen general paralytics is a matter of great importance. Although the micro-organism has not been found in every case examined, there can now be no doubt as to the true nature of this disease. The assumption of a parasyphilitic disease is no longer required. This discovery was no doubt largely foreshadowed when it was found that the cerebrospinal fluid and the blood of general paralytics reacted positively to the Wassermann test, but the finding of the spirochæte in the cortex of the brain puts an end to controversy. The cause of general paralysis has been discovered. There is, however, still room for doubt whether the spirochæte in question is identical with that producing syphilis. The fact that general paralytics rarely shew marks of tertiary syphilis, and that even when there is a history the initial symptoms are often peculiarly mild, and further the failure of antisyphilitic treatment to prevent the development of general paralysis, leaves room for querying whether there may not be varieties of spirochætes, one specially attacking skin or connective tissues and another with special affinity for nervous structures. It is interesting to note that the spirochætes are found in the grey matter of the convolutions, lying amongst the nerve cells, and they are rarely seen in the white matter or in the pia-arachnoid.

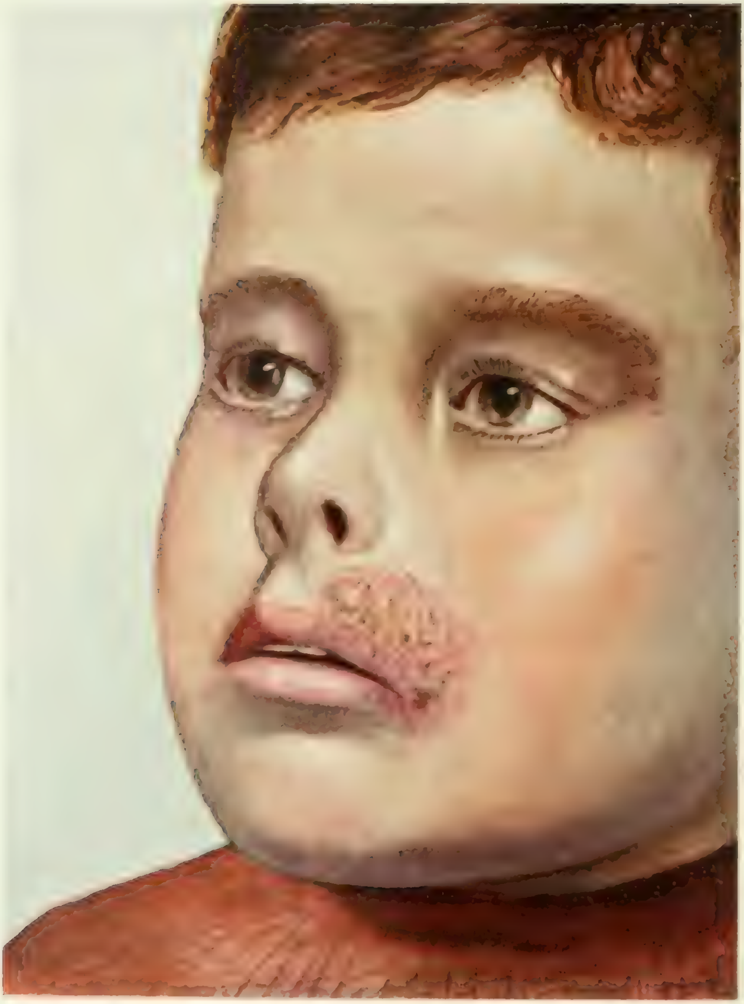
G. M. Robertson[1] discusses the problem of general paralysis at length: its symptoms, its early diagnosis, its etiology, and particularly its treatment. Five methods of treatment were adopted: (1) Intravenous injection of **Salvarsan**; (2) Intraspinal injection of **Antisyphilitic Serum**; (3) Intraspinal injections of **Salvarsan Serum**; (4) **Urotropin**; (5) **Calomel**. In all cases the results were disappointing, although in some there was a decrease in the lymphocytosis and a diminution of intensity of the Wassermann reaction.

Barton White[2] made an exhaustive examination of the urine of ten cases of general paralysis before and after the administration of hexamethylenetetramine (**Urotropin**). In all these cases, before treatment, micro-organisms were found, viz., *B. coli* in three, a diphtheroid in four, a staphylococcus in five, a streptococcus in two, and a diplococcus in one. The drug was given for varying periods from two to ten weeks, and in every case except that with the diplococcus the urine was found to be sterile at the second test and remained so for several days. Treatment with specially prepared vaccines was not encouraging. The opinion was expressed that the routine treatment of several paralytics by hexamethylenetetramine was justified, and that in consequence there were fewer seizures, the course was prolonged, and the difficulties of nursing were reduced. Collins stated that he had found urotropin produced incontinence. Soutar said that clinically he had found urotropin of value.

Mental Deficiency and Syphilis.—Kate Fraser[3] summarized the results of investigations, by means of the Wassermann reaction, as to the frequency with which syphilis is found associated with mental disease and epilepsy. These results varied from 1·5 to 30 per cent. Thomson and his co-workers examined by the original method upwards of 2000 cases of mental deficiency, and found that only 31 gave a positive reaction, and only one among 15 cases of epilepsy. In contrast to this, Raviart and others examined 246 idiots, and found that 50 per cent reacted. Of her own cases, 99 in number, 10 were epileptic without decided mental defect. Of the 89 defectives, 30 gave a positive reaction and 11 were doubtful. Of the 10 sane epileptics, 4 gave a positive reaction. Members of the family were investigated in 13 cases

PLATE LXI.

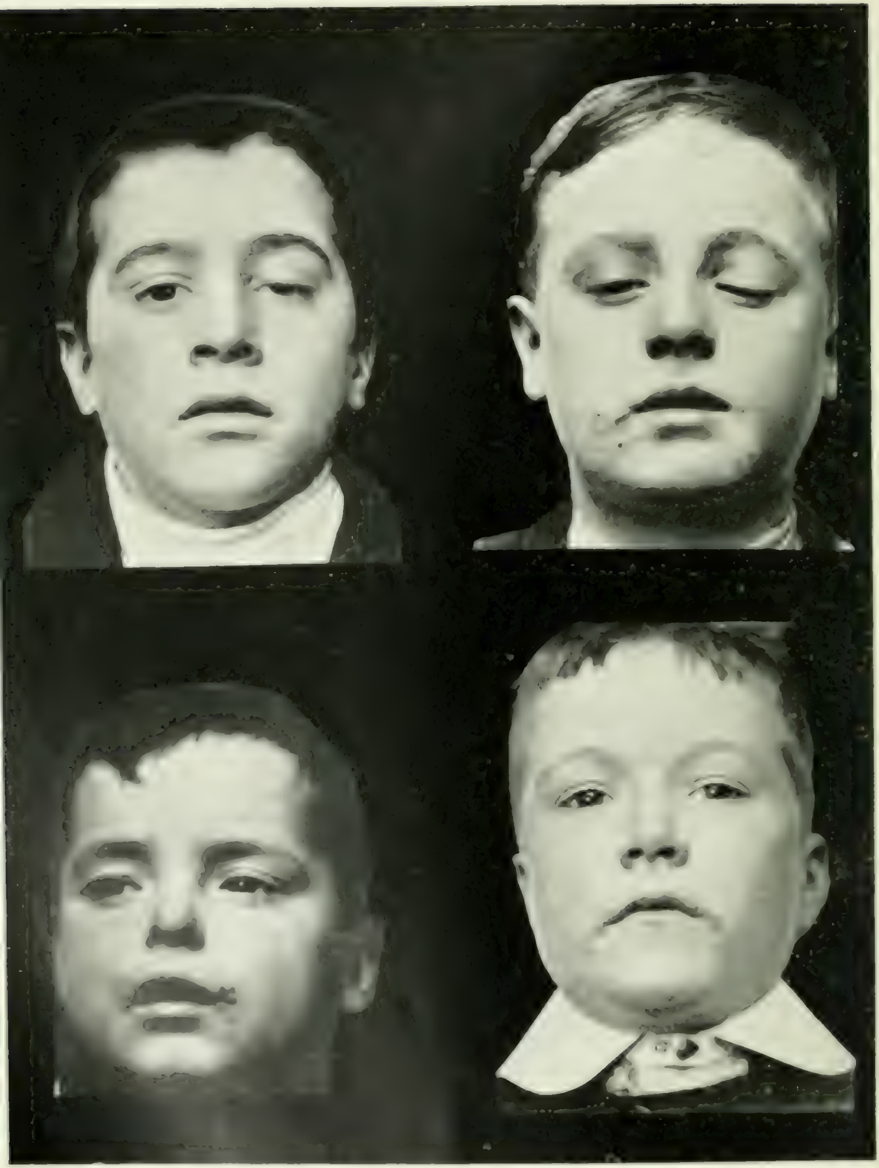
ECZEMA ORIS SYPHILITICA



[illegible]

PLATE LXII.

ECZEMA ORIS SYPHILITICA



[illegible]

[illegible]

where the child gave a negative result, and a positive reaction was obtained in 8 instances. If these cases are included, the Wassermann reaction showed that 57·7 per cent had been infected with syphilis. Stigmata of syphilis were found in only 8 of the positive cases. It was noteworthy that of 23 normal children taken as controls, 2 gave a positive result, 19 were negative, and 2 doubtful.

REFERENCES.—¹*Jour. Med. Sci.* 1915, Apr.; ²*Ibid.* Oct.; ³*Ibid.*

SYPHILIS, CONGENITAL. (*See also* SYPHILIS.)

Frederick Langmead, M.D., F.R.C.P.

Leonard Findlay and H. Ferguson Watson[1] add yet another condition to the many which are ascribed to congenital syphilis. They designate it "*eczema oris syphiliticum*" (*Plates LXI, LXII*). In its most typical form the lesion is situated at one or both angles of the mouth, and radiates therefrom towards the cheek, sometimes in the form of fan-shaped patches. It may, however, completely surround the mouth and implicate the face extensively. The patches are somewhat irregular in shape, with sharply-cut or ill-defined margins. These are red in colour, the hyperæmia at times being very marked. The surface is, as a rule, dry and scaly, although occasionally, especially during exacerbations, there may be some discharge, with the formation of crusts, and at this period there is always a certain degree of induration. The eczematous patch is continuous with, and frequently invades, the mucous membrane of the lip, giving a slightly papillary appearance. The lips themselves may be swollen to a greater or less degree. A similar condition around the nostrils (where there is usually a greater tendency to moisture), and eczema tarsi are also present in a proportion of the cases. It is a most obstinate and chronic malady, varying much in severity from time to time. Of the patients, twenty-one in all, only five manifested specific stigmata. All but two reacted positively to the Wassermann test, while the blood of the mothers of these two gave a positive result. The appearance of the lesion was sufficiently characteristic to permit a diagnosis on purely clinical grounds.

Most English observers regard *craniotabes* as due to congenital syphilis, but Leroux and Labbé,[2] from an examination of thirty-two cases, come to the conclusion that it is an osseous dystrophy due to multiple causes, congenital syphilis being the most important. In the 32 cases examined, syphilis was found in 17, tuberculosis in 5, parental alcoholism in 2, other inherited states in 3, whilst the cause was obscure in 5. The authors remark that craniotabes generally occurs in infants affected by inherited dystrophic conditions, whose nutrition has suffered *in utero*, and who are usually born prematurely or in an enfeebled condition.

The influence of syphilis on *infant mortality* and the future of the race continues to attract attention. Thus Mott[3] states that a large number of infants exist who, though apparently healthy, are really infected, and should be treated to prevent them from suffering from the disease later in life. According to him, all mothers of congenital syphilitic children give a positive Wassermann reaction, and thus by this reaction we have not only a means of ascertaining whether the apparently healthy but suspected infant should be treated to prevent it from developing serious disease, but also examination of the blood of the suspect but apparently healthy mother will enable treatment to be applied to her which will permit of the birth of healthy uninfected children.

Amentia would appear to bear a closer relation to congenital syphilis than has been acknowledged hitherto. Thus W. C. Stoner and E. L. Kotee[4] applied the Wassermann reaction to 1030 unselected cases of all grades of mental deficiency, and found it positive in 7·0 per cent; Lippmann[5] in 58 cases obtained a positive reaction in 0 per cent; Dean[6] in 330 idiots in 15·4 per cent; and Raviart, Breton, Petit, Gayet, and Cannae,[7] in 246 cases, in more than 30 per cent.

It must be remembered, however, that investigators are still actively engaged in testing the validity of the Wassermann reaction as a means of diagnosis of congenital syphilis. Thus F. S. Churchill[8] employed the reaction in 102 children, aged from three days to twelve years, admitted to hospital for various diseases other than syphilis. A positive result was obtained in 39 cases; 24 of these showed suggestive physical signs; in 5 there was a suggestive family history or positive personal record; and in 10 there was neither family history, personal history, nor physical signs suggestive of the disorder. This author admits that some of these may have been the subjects of *syphilis hereditaria tarda*, but in 3 fatal cases in this group there was no gross or microscopic evidence of syphilis post mortem. E. Andronesco and P. Sototomo[9] tested 22 syphilitic children and 13 mothers by Wassermann's original method. They conclude that: (1) Colles's law is quite correct; (2) Mothers of syphilitic children give as positive a Wassermann reaction as cases of florid syphilis; (3) The number of births has no influence upon the reaction; (4) The reaction is more intense in congenital syphilitic children than in their mothers who are free from visible lesions. D. Caffarena[10] tested the reaction in 20 rickety children, and found it positive in 6. This observation cannot be said to argue against the value of the test, for it opens up the question of the relationship of rickets to congenital syphilis. (See also SYPHILIS, CEREBROSPINAL.)

TREATMENT.—The work of W. P. Lucas[11] throws further doubt on the efficiency of our treatment. He traced 59 cases which had received hospital treatment. These he divided into three groups: (1) Those who apparently were mentally normal; (2) Those who were mentally backward; and (3) Those who had died. There were 19 in the first group; of these, 3 were of school age, ranging from six to sixteen years; 12 were between two and six years; and 4 were under two. The mentally backward also numbered 19, of whom 11 were of school age and 8 were between two and six years old. Twenty-one had died. He attributes the high mortality and percentage of backward children to the lack of more systematic following up of the treatment. Many of the infants were not brought for treatment after the rash had disappeared.

Salvarsan, as a remedial measure, is still on its trial. L. E. La Fetra's[12] results are favourable to it. He has treated a series of 25 cases of congenital syphilis in children, aged from six weeks to two years old. Ten received salvarsan with or without mercury, and 15 were treated with mercury alone. Of the former, only 2 died; all the rest showed marked gain in weight and improvement in the general condition. Of the latter, 3 improved, 2 remained stationary, and 10 died. He recommends a dose of not less than 0·06 gram per kilo. of the body weight. L. Maccone[13] records 10 cases treated by salvarsan. The children's ages varied from eighteen months to twelve years: 5 recovered, 4 showed some improvement, and in only 1 was the condition uninfluenced. Of 9 who showed a positive Wassermann reaction before treatment, 8 lost it. He thinks that "606" is an efficient remedy in the secondary generalized forms of congenital syphilis. In the tertiary localized forms it is less active, whilst in the later stages including the dystrophic forms, its action is *nil*. Weil, Morel, and Mouriquand[14] were led by the difficulties of intravenous injection in young children to administer the drug per rectum. Five to 10 drops of laudanum were added to the solution to ensure rectal tolerance. The authors found that the drug was easily absorbed by the mucous membrane, and that definite amelioration of the symptoms was produced. No local or general reaction occurred, an observation which led these authors to prefer the rectal route for the administration of salvarsan in children.

REFERENCES.—[1]*Lancet*, 1913, i, 875; [2]*Arr. de Méd. et Chir. Inf.* 1912, xvi, 481 (*Brit. Jour. Child. Dis.* 1913, 44); [3]*English-speaking Conf. on Infant Mortality*; [4]*Cleveland Med. Jour.* 1912, x, 251 (*Brit. Jour. Child. Dis.* 1912, 514); [5]*Brit. Jour. Child. Dis.* 1912, 388; [6]*Ibid.* 385; [7]*Ibid.* 388; [8]*Amer. Jour. Dis. Child.* 1912, 362 (*Brit. Jour. Child. Dis.* 1913, 44); [9]*Presse Méd.* 1912, xx, 271 (*Brit. Jour. Child. Dis.* 1913, 45); [10]*Gaz. d. Osped.* xxxiii, 642 (*Brit. Jour. Child. Dis.* 1913, 45); [11]*Bost. Med. and Surg. Jour.* 1912, ii, 278; [12]*Arch. of Ped.* 1912, 654 (*Brit. Jour. Child. Dis.* 1913, 45); [13]*Gaz. Internaz. d. Med., Chir., etc.* 1912, 652, 727, 776 (*Brit. Jour. Child. Dis.* 1913, 45); [14]*Lyon Méd.* 1912, cxix, 45 (*Brit. Jour. Child. Dis.* 1913, 46).

TABES DORSALIS. (*See* SYPHILIS, CEREBROSPINAL.)

TESTIS, INFLAMMATION OF. (*See* ORCHITIS.)

TETANUS.

Purves Stewart, M.D., F.R.C.P.

TREATMENT.—Three years ago, in the MEDICAL ANNUAL, the writer gave a resumé of various modern methods. Of these remedies the chief are antitetanus serum, carbolic acid, and magnesium sulphate. Baccelli's results by the carbolic-acid treatment were discussed in the MEDICAL ANNUAL for 1912, and it now seems an opportune time to describe somewhat more in detail the chief facts of interest in connection with the treatment by **Magnesium Sulphate.**

Before the introduction of anti-tetanus serum by Ehrlich in 1890, the mortality in cases of tetanus according to v. Leyden, was from 80 to 90 per cent, some authors placing it as high as 95 per cent. The introduction of serum-therapy reduced this mortality to a considerable extent, some observers placing it as low as 28 per cent (Engelmann), others as high as 55 per cent (Smith). By the carbolic-acid treatment without anti-tetanus serum Baccelli claims to have reduced the mortality to 17·4 per cent in a series of 190 unselected cases. Dutoit,[1] with a much smaller number of cases collected from various sources and treated by magnesium sulphate, finds that 5 out of 22 were fatal, i.e., a percentage of 22·7 per cent deaths.

Meltzer and Auer, working in the Rockefeller Institute, have conducted numerous experiments upon the effect of magnesium salts. They found that when solutions of magnesium sulphate or magnesium chloride are injected *hypodermically* in an animal in the proportion of 1·5 parts per 1000 of its body weight, the result is a deep sleep with complete anæsthesia and total relaxation of the voluntary muscles and loss of deep reflexes. If the above dose be not exceeded, the animals recover after a certain time. If the dose be too high (over 2 parts per 1000) death occurs from respiratory paralysis, the heart's action being preserved for a time after the breathing has ceased. The same observers studied the effects of intravenous injections of magnesium sulphate, and pointed out that the respiratory paralysis which was produced could be successfully treated by artificial respiration, whilst meantime cardiac action and blood-pressure remained unchanged. On subcutaneous injection of a 25 per cent solution of the drug, they produced anaesthesia without any initial stage of irritation, and observed that sensory functions were paralyzed before motor. The symptoms thus produced could be washed out, as it were, after a certain time, by means of transfusion with normal saline or with Ringer's serum. Thirdly, they tried the effect of *intrathecal* injection of magnesium sulphate solution, and found that sensory and flaccid motor paralysis set in within two minutes, especially affecting the lower limbs and trunk, and gradually spreading upwards. The conjunctival reflexes, as before, together with the cardiac activity and the blood-pressure, remained undiminished. Meanwhile respiration became markedly slowed and inefficient. The sensory and motor paralysis lasted several hours.

Reasoning from the foregoing experiments, performed chiefly on monkeys, to the human subject, Kocher estimated the therapeutic intrathecal dose for a man of 70 kilos (154 lbs.) to be about 5 grams (gr. lxxv), i.e. about 20 c.c. of a 25 per cent solution of magnesium sulphate. Meltzer, injecting the drug subcutaneously, produced anæsthesia culminating in narcosis, reaching its climax in about three to four hours and permitting of surgical operations by the end of the second hour. Intravenous injections are more rapid in their effect, and intrathecal injections still more so, but the risk of respiratory failure is greater. On the completion of the operation, after magnesium sulphate anæsthesia. Meltzer and Auer recommend the withdrawal of a small amount of cerebrospinal fluid, followed by irrigation of the subarachnoid space with sterilized normal saline solution. If this be done, they find that the paralytic phenomena clear up more quickly; also there is less risk of retention of urine or of root pains in the legs.

Meltzer and Joseph, in discussing the relative toxicity of magnesium, calcium, potassium, and sodium salts (all of which are normal constituents of the tissues), maintain that their toxicity is in inverse proportion to their amount in the blood serum. This explains why normal saline solution is relatively innocuous, whereas magnesium salts, being normally scanty, are specially toxic when introduced intravenously or intrathecally.

Mathews and Clyde consider that the action of magnesium salts, in producing paralysis of respiratory muscles, closely resembles that of curare. Muscular tremors produced by physostigmine are removed by magnesium salts. Now Pal showed that physostigmine is antagonistic to curare. We are therefore not surprised to learn that, as Joseph and Meltzer have shown, physostigmine arrests the paralytic effect of magnesium sulphate upon the respiratory muscles and promptly improves respiration, notwithstanding that the general muscular flaccidity and anæsthesia persist unchanged for hours.

With regard to the **Treatment of Tetanus by Magnesium Sulphate,** Henderson originally introduced the solution through a small trephine opening direct on to the cerebral cortex by means of a special needle. Kocher, however, introduces the drug through a lumbar puncture needle. Discarding the stronger solutions used by him in his earlier cases, he administers 5 c.c. of a 15 per cent solution. A sleep similar to that following a narcotic is usually produced within an hour, and lasts two hours or so. If stronger solutions, e.g. 25 per cent, be introduced, the effects are too intense, the unconsciousness may last twenty-four hours, and oxygen inhalation may be necessary; the weaker solution is safer, and produces all the desired effects, especially if the lower part of the trunk be raised so as to favour diffusion of the drug towards higher levels of the body.

In view of the possible effects on the respiratory centre, other observers confirm the view as to the desirability of a suitably diluted solution. Thus Blake, who at first gave four daily injections, each of 4·5 c.c. of a 25 per cent solution, later gave 8 c.c. of a 12·5 per cent solution, and obtained complete cure. Kocher emphasizes the helpfulness of oxygen inhalations should respiratory failure threaten, and if the heart also becomes suspiciously slow he recommends an intravenous injection of atropine $\frac{1}{4}$ gr. Arndt, on the other hand, prefers to combat respiratory failure by washing out the lumbar cavity with normal saline solution after the method of Meltzer and Auer.

Tidy[2] records a case of tetanus in a boy of eight treated by intrathecal injections of 3 c.c. of a sterilized 25 per cent solution of magnesium sulphate at intervals of three and four days. The spasms subsided, and the patient was discharged cured. Three days after the last injection of magnesium sulphate, when the patient was already convalescent, a subcutaneous injection of antitetanic serum was also administered.

In an excellent review upon the subject, Ashurst and John,[3] of Philadelphia, discuss the rationale of treatment, and report twenty-three consecutive cases of tetanus treated in hospital during the last eight years. The following are their more important conclusions:—

Tetanus is a pure toxæmia. The tetanus bacilli or their spores may exist in the tissues indefinitely, but no symptoms are produced unless toxins are formed. Moreover, if the toxin be introduced into the system it produces all the symptoms of tetanus, even though no bacilli are present. In the small animals used in laboratory experiments for the injection of tetanus toxin, the symptoms usually begin in the inoculated limb, developing first in the injured part and gradually ascending—so-called *tetanus ascendens*. But in the larger animals, and in man, in whom the disease is acquired, not by the injection of toxin but by inoculation with tetanus bacilli, the symptoms begin in the muscles of the neck and jaws, no matter where the point of inoculation has been. The muscles of the back and limbs are affected later, the lower extremities being attacked last of all. The disease is, therefore, distinguished as *tetanus descendens*. The probable explanation of these differences was advanced in 1900 by Sawamura. In experimental animals the toxin is injected into the muscles, usually of the lower limb, and thus, coming into close relation with the adjacent motor nerves, it is rapidly absorbed by them and conducted upwards to the corresponding area of the spinal cord, producing tetanus of the infected limb. In man, however, the usual point of inoculation is not intramuscular, but in the subcutaneous tissues of the hand or foot, and the toxin produced in the wound is absorbed into the lymphatics and general circulation. It is thus carried to the end-plates of all motor nerves throughout the body. The toxin then advances up the various nerves towards the brain-stem. The shortest nerves being those of the facial, masticatory, neck, and spinal muscles, tetanic toxins reach the brain-stem, and produce tetanic spasms in the muscles supplied by these nerves before the toxin in the wounded extremity has had time to ascend the long nerves of that limb to the corresponding part of the cord. Ascending tetanus is uncommon in man, and when it does occur, it is usually found that the point of inoculation was intramuscular (12 out of 21 cases of ascending tetanus collected by Sawamura). Cephalic tetanus following wounds of the face and head is an ascending tetanus.

In experimental tetanus the tetanus toxin ascends the peripheral nerves to the spinal cord, not only along the peri- and endoneurium, but also, as Meyer and Ransom have shown, by way of the axis-cylinders. Only when it reaches the motor neurons does it begin to produce symptoms corresponding to the area of spinal cord or brain which is attacked. The nearer the toxin gets to the spinal cord, the more intimately does it become combined with the nervous tissue.

The *incubation period* depends on the distance from the cord of the site of injection of the toxin. Having reached the cord, the toxin diffuses up and down it. Some of the toxin enters the general circulation and can be detected in the blood. This toxin, being carried to the motor end-plates throughout the body, eventually reaches the cord as above described, and produces descending tetanus. The toxin stimulates the motor cells of the cord, producing tonic spasm of the corresponding muscles. It is unnecessary to recapitulate the classic symptoms of tetanus; but it may be recalled that the slightest stimuli, e.g. slamming a door, jarring the patient's bed, a sudden draught of air, etc., at once intensify the spasms.

Preventive Treatment.—It is well known that the tetanus bacillus is anaerobic, and that, normally infesting the intestinal tract of horses and cattle, it is deposited with their dung, and is found in farmyards, stables, gardens, and streets. According to Fox, tetanus bacilli are found in the fæces of 5 per cent of mankind, and in the fæces of 20 per cent of men who work amongst horses. On these accounts, therefore, wounds sustained by farmers, gardeners, stablemen, etc., and wounds contaminated by dust or mud, are specially likely to be infected with tetanus bacilli. Infection is favoured by an anaerobic condition of the wound. Sloughing tissues are particularly good culture media. A mixed infection, especially with saprophytic bacteria, is favourable for development of the disease, because these organisms, being aerobic, absorb all the available oxygen, and provide anaerobic conditions for the tetanus bacilli. Careful attention to the original wound is therefore the first and most important step in the prevention of tetanus. Ashurst and John treat a suspected wound as follows: The surrounding skin is painted with a 3 per cent alcoholic solution of iodine. All parts of the wound are then made freely accessible, by wide incision if necessary. The wound is carefully cleaned up with scissors and forceps, and is then thoroughly swabbed out with the iodine solution. Finally, it is lightly packed with gauze soaked in iodine solution. All caustics are avoided, since the presence of sloughs, however minute, favours the growth of tetanus bacilli. At subsequent daily dressings of the wound it is irrigated with peroxide of hydrogen until active effervescence ceases, and is again packed with gauze soaked in iodine. Prophylactic injections of **Tetanus Antitoxin** are given, one at the very start, preferably intramuscularly rather than subcutaneously, and in the vicinity of the wound. If any nerves are exposed in the wound, the antitoxin should be injected into them. The antitoxin is completely eliminated in about eight to ten days; hence a second injection should be given at the end of seven or eight days, and a third injection during the third week. In fifty-five cases collected by Ramertz where tetanus developed in spite of the prophylactic use of antitoxin, nearly all were cases in which only one injection was given. It is doubtful whether this is the main reason for the relative failure of antitoxin alone to prevent tetanus in man, as compared with its most successful action in horses. Possibly the fact that horses are treated by antitoxin derived from their own serum, while human patients are treated by an alien (horse) serum, makes a difference.

If symptoms of tetanus have already appeared by the time the patient comes under treatment, then, in addition to cleansing of the wound as above described, Ashurst and John proceed to give intraspinal and intraneural injections of antitoxin, for reasons to be presently referred to. In wounds of the sole of the foot, the sciatic nerve should be selected for intraneural injection; for the upper extremity, the brachial plexus should be exposed above the clavicle, and an injection made into each of its cords.

Ashurst and John discuss the therapeutic use of tetanus antitoxin. The following sites of injection have been advised: subcutaneous, intravenous, intraspinal, intraneural, intracerebral, and intramuscular. Subcutaneous injection, although it is the method most usually employed, is the least efficacious, since only a fraction of the antitoxin ultimately reaches the motor nerves and spinal cord, while the main mass of the injection is distributed to the viscera, where it can be of no possible use. Administered in this way, overwhelming amounts, 100,000 units at least in twenty-four hours, are required to produce any effect. Intravenous injection is rather better than subcutaneous, and is easier than intraspinal or intraneural injection. Intraspinal (subdural) injections are better still, and from 5000 to 10,000 units should be given, according to the severity of the case. This may be repeated in eighteen to twenty-four hours if necessary. Intraneural injection into the nerve-trunk of the affected limb may be used as an important accessory to intraspinal injection. As much antitoxin as the nerves will absorb should be given. One thousand five hundred units have been injected into the sciatic nerve, and 750 units into the anterior crural and obturator nerves. Intracerebral injections present no advantages over intraspinal, and have the drawback of occasionally causing lasting damage to the brain. Intramuscular injections are better than subcutaneous, but inferior to intravenous, and certainly much inferior to intraspinal and intraneural.

As to the frequency of injections of antitoxin, the usual fault is that it is only given once. When given intravenously, it should be repeated in twelve to twenty-four hours. Intraspinal injections should be given at longer intervals, say one to three days. Intraneural injections can be repeated daily if required. No matter what the channel of administration be, the important thing is to get the maximum amount of antitoxin in contact with the spinal cord and nerves, as soon as possible.

Ashurst and John refer to Baccelli's treatment by the injection of 1 c.c. of a 4 to 5 per cent solution of **Phenol** into the muscles until 80 or 100 cgrams are given in twenty-four hours. They admit the excellent results obtained by the Italian school by this method, and point to the tolerance of tetanic patients for carbolic acid; but they themselves only employed it once in a series of twenty-three cases. They also refer to the relief afforded by intraspinal injections of **Magnesium Sulphate**, its action being mainly that of a spinal depressant. To depress the functions of the spinal cord is undoubtedly an important indication, but care must be taken not to produce respiratory failure by an over-dose.

Other points of importance as regards the management of the patient are to attend carefully to the feeding and to the bowels. Nasal feeding may be necessary. Retention of urine must be watched for, and relieved by catheter. Isolation is desirable in order to protect the patient from noise. Slamming of doors, loud talking, rattling windows, etc., should be prevented. The patient's ears may be stopped with cotton-wool and the floor heavily carpeted.

Ashhurst and John record 23 cases of tetanus observed by themselves. Of these, 10 recovered and 13 died, making a total mortality of 56·5 per cent. In 5 of these cases, where efficient treatment was begun within twelve hours of symptoms, only 1 died, making a mortality of 20 per cent under these conditions. In 18 cases where efficient treatment was delayed beyond twelve hours of symptoms, 12 died, i.e., a mortality of 66·6 per cent. Antitoxin was used in all 23 cases; efficiently as to method and quantity in 12 cases, with a mortality of 46·1 per cent; and inefficiently in 11 cases, with a mortality of 72·7 per cent.

References.—[1]*Deut. med. Woch.* 1913, Mar. 20; [2]*Amer. Jour. Med. Sci.* 1913, i, [illegible], and ii, 77.

THREAD-WORMS. *Robert Hutchison, M.D., F.R.C.P.*

Hildebrand[1] believes that the persistency of the presence of thread-worms in some cases in spite of treatment is due to constant re-infection of the patient by the conveyance of the ova from the neighbourhood of the anus to the mouth. In order to prevent this it is necessary to use some agent which will destroy the ova as soon as they pass the anus. For this purpose he uses an ointment composed of **Camphor, Quinine,** and **Thymol,*** which is applied thus: Morning and evening the peri-anal region is thoroughly washed with soap and water; thereafter a piece of the ointment varying in size from a pea to a cherry is smeared over and around the anus. The procedure is repeated after each action of the bowels, and before each meal the hands and nails are thoroughly cleaned. The treatment must be continued for two or three weeks. He has employed this plan in several very obstinate cases, and has always found it prove successful.

Reference.—[1]*Münch. med. Woch.* 1913, 131.

THROMBOSIS. (See Operations, Complications Following; Otitis Media; Vena Cava.)

THYROID GLAND, SURGERY OF. (*See also* Goitre, Exophthalmic.)

Priestley Leech, M.D., F.R.C.S.

Charles Mayo[1] gives the results of five thousand operations performed in the St. Mary's Hospital clinic, in Rochester, for the following diseases of the thyroid gland :—

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* Ung. Chinin. Camphorat. Co. Supplied in collapsible tubes by Houten, pharmacist, Emmendingen.

Simple goitre, including 11 transplantations in cretins	[illegible]
Malignant disease (carcinoma [illegible], sarcoma [illegible])	[illegible]
Exophthalmic goitre, including double and single ligation, total and partial thyroidectomy	2295
Syphilitic disease	1
Early operations, not classified, the majority being simple goitres	[illegible]
Total	[illegible]

The occasional large goitre in the cretin has but little active parenchyma, and if it causes distress should be removed. Mayo has repeatedly transplanted fresh gland from the mother, and also from fresh simple and exophthalmic goitres, but in no case did the transplanted gland functionate, though for a short time it furnished secretion by absorption. *Paresis of the recurrent laryngeal nerve* is fairly frequent from pressure of a goitre, and if the cords are not examined before operation, the latter may be blamed for the change in the voice. Secondary paresis may occur from scar tissue resulting from traumatism due to a too large exposure of the nerve. *Intrathoracic and deep substernal goitres* are of serious import, and are found about once in fifty operations for simple goitre. The diagnosis rests in a dull area on percussion, skiagraphy, evidences of substernal pressure (dilated veins, obstructive dyspnœa), and palpation of the upper pole of the gland just above the clavicle. Injury to the *parathyroids* is best avoided by preserving the posterior capsule, especially when both sides are operated on; and as they are difficult to identify, it is best to leave all small glandlike bodies beneath or connected with the posterior capsule. Treatment of post-operative *tetany* with **Calcium Lactate**, and also **Beeves' Parathyroid** with **Thyroid Extract**, has been very effectual.

Many forms of simple goitre, especially of the adolescent type, undergo a natural resolution. **Iodine** is sometimes useful. More recent experience seems to indicate the use of **Thymol** and **Salol** as intestinal antiseptics. In exophthalmic goitres temporary improvement has been obtained by the use of **X-rays**, which also seem to be of use in carrying serious cases through exacerbations. The cytolytic sera have not given the results expected.

The best incision is the low transverse one. In simple goitres, a greatly enlarged lobe should be extirpated. If both lobes are symmetrically enlarged, division of the isthmus with double resection of the gland is indicated as giving the best cosmetic results. Mid-line encapsulated adenomata should be enucleated, with division of the isthmus. Lateral encapsulated adenomata may be enucleated or the whole lobe extirpated. If symptoms of hyperthyroidism are present, extirpation is indicated. In severe cases of hyperthyroidism, in acute attacks and relapses or exacerbations, the condition should be considered medical until improvement takes place. If no improvement occurs, **Injections of Boiling Water** into the lobes (Porter) may give relief. During the first three or four months of the symptoms, extirpation can safely be made, since the heart then is not dilated. If it is dilated to exceed one such, primary ligation of the superior thyroid vessels is indicated followed in four months by extirpation. After the first year of symptoms a much smaller percentage of cases requires primary ligation. A single test ligation may be made in doubtful cases, to be followed in a week by a second ligation or partial extirpation according to the degree of reaction. The records of a large number of patients show an average gain of 22 lb. within four months after ligation. These patients were then operated on, a partial thyroidectomy being done with safety. Following these methods the Mayos have performed 278 operations on cases of hyperthyroidism between deaths.

Long-standing cases of simple goitre and adenoma may, by degeneration or chronic slow thyrotoxicosis, cause serious disturbances in the heart, kidneys, and blood-vessels; this is especially true of patients in middle and advanced life. When such complications are present, operations are attended by considerable risk.

Excluding malignancy, the death-rate is low, and varies little in cases of so-called simple goitre and so-called exophthalmic goitre. The greater the delay the greater the mortality in exophthalmic cases; in Mayo's first sixteen cases the mortality was 25 per cent, whereas it is now 1 to 3 per cent. In cases of hyperthyroidism operation appears to give about 75 per cent of cures, while the remaining 25 per cent are more or less benefited. Probably 10 per cent have some degree of relapse in from one to three years after operation, usually manifested by return of symptoms. In these rare cases, ligation of the vessels, with removal of a portion of the remaining lobe, in most instances improves the condition of the patient. Exophthalmos of marked degree and long standing may still be present when other symptoms are cured.

In patients in good general condition a general anæsthetic, ether by the drop method, is preferred, with $\frac{1}{4}$ gr. of morphine and $\frac{1}{150}$ gr. of atropine half an hour before the operation. If general anæsthesia be inadvisable, free local injections of 0·5 per cent solution of novocain are given. A combined local and general anæsthesia, as advocated by Crile, may be of advantage in certain cases. Intratracheal anæsthesia is indicated in those cases of " scabbard " or distorted trachea, in which the patient is already suffering from dyspnœa, especially in the presence of malignant disease of the thyroid, and complications due to enlarged thymus.

Crile, in course of a discussion, said he had no more doubt as to the benefits of operation in exophthalmic goitre than of that of opening an abscess. He had never seen recovery in a single case of cancer of the thyroid diagnosed as such before operation; he had seen a few cases cured in which cancer, previously unsuspected, was found by the operator.

Porter[2] has tried the **Injection of Boiling Water** in exophthalmic goitre. He has treated over twenty patients with one hundred injections; the quantity injected at each point varied from 40 to 230 min. The largest quantity injected at one treatment was 660 min., equally divided between the isthmus and the right and left lobes. The immediate effect is destruction of thyroid tissue and colloid. A further destruction of thyroid cells occurs as a result of the consequent formation of fibrous tissue. Local anaesthesia at the point of puncture abolishes pain. Four patients were cured. He uses an all-glass graduated syringe, and injects inside the capsule. He thinks it will prove of value in cases which are not good surgical risks. Reports of cases are given, and also the histological results of injection into the thyroid of dogs.

Berry,[3] in the Lettsomian Lectures, considered the surgery of the thyroid gland with special reference to exophthalmic goitre. He professes a profound scepticism as to the present teaching, especially that of America, as to the functions of the parathyroids. In all cases of Graves' disease there is a persistent thymus, and Berry says he has never failed to find the condition in any of the autopsies in cases which he has seen. The thyroid always shows the same structure, and may easily be recognized by the naked eye; the gland, instead of presenting the vesicular appearance characteristic of the normal tissue or of the ordinary parenchymatous goitre, looks solid and almost homogeneous, like a salivary gland or the pancreas. In cases to which he gives the name of secondary Graves' disease, there is evidence of previous goitre as shown by fibrosis, calcification, adenomatous or cystic degeneration, etc.; but in these cases the Graves' disease is not caused by the previous goitre, and is a separate occurrence. This view is strengthened by the fact that exophthalmic goitre is no more common in regions of endemic goitre than it is elsewhere, as would be the case were this latter a predisposing factor. There is no evidence that Graves' disease can occur without thyroid hyperplasia, and there is a definite relation between the symptoms of the disease and the condition of the gland

Medical treatment does nothing to cure the disease. Many cases abort at an early stage, and come to an end spontaneously; in many instances where the patient can take abundant rest the disease wears itself out. He thinks rodagen and the milk of thyroidectomized goats of but little value. **X-ray Treatment** is of real use; it is most suitable for early cases, and also for acute ones, in which operation is dangerous. He is doubtful as to the value of any serum.

As regards **Operation** in exophthalmic goitre, Berry has lately modified his opinion. Anything like indiscriminate operating for this condition is to be strongly deprecated. Operations on the acute and advanced cases are very dangerous and not to be lightly undertaken. "Advanced" cases are not those of long duration, but rather those in which the intoxication is acute, and secondary degenerations of viscera, especially of the heart, are present. The difficulty in considering the question of operation is the question, What is exophthalmic goitre? If we only include the well marked cases, we shall find the operative mortality is very much higher than if we follow the tendency of the present day and include many cases which have not well-defined symptoms. A patient with an ordinary parenchymatous goitre, or an adenoma or cyst of the thyroid, who has some tachycardia, and complains of palpitation, is regarded by some observers as a mild case of exophthalmic goitre, by others as a case of hyperthyroidism, and therefore belonging to the same class, despite the fact that the majority of such patients, if allowed to progress, never develop exophthalmos or the more serious symptoms.

Two main facts stand out: (1) *The danger of the operation* as often performed; and (2) *The undoubted benefits that results* in a large proportion of the cases. Care should be exercised in drawing conclusions from mortality statistics of published records; probably the only safe test is the pathological one, and mortality statistics based on pathological findings are rare. Another difficulty is that cases of Graves' disease do not pursue a uniform and progressive course. One may go from bad to worse, and another come to an end spontaneously. If we knew that every case would go progressively down hill, the dangers of operation would require less consideration.

In Berry's opinion, operation should not be undertaken in acute cases where there is much thyroid intoxication, as shown by great excitability, mania, or muscular weakness; or in those suffering from any acute inflammatory affection, such as acute bronchitis, or in those cases in which marked degenerative changes have taken place in the viscera, especially in the heart and kidneys. Albuminuria, glycosuria, diarrhœa, a constantly irregular pulse and low blood-pressure, are all conditions which should lead the surgeon at least to postpone operation; if these conditions cannot be remedied by medical treatment, no operation should be performed. Of all chronic complications, marked dilatation of the heart is perhaps the most common and serious.

Of Berry's own operation cases, with the exception of two that died, all have benefited, although in one or two the benefit has not been great, and in one case at least there has been a slight relapse. Even after a single ligation, patients nearly always say they feel better; the objective signs of the disease may remain, but still the patients feel better, and can lead a more active life than formerly.

As regards the *anæsthetic*, chloroform is more dangerous than ether; ether by the closed method is more dangerous than open ether; while local analgesia is most suitable for the severe type of case if the patient is willing to submit to operation under these conditions. Its main advantage is that the patient can drink freely during and immediately after operation; the principal disadvantage is the psychic effect upon a nervous patient. It is important not to operate upon any one who is in a condition of great alarm.

The operation of choice in exophthalmic goitre is removal of part of the gland; next to asepsis, efficient hæmostasis is the most important point. The danger of bruising or crushing the gland is greatly overrated, and the so-called attacks of acute thyroidism are not to be explained solely, if at all, by mere manipulation. The most important point in after-treatment is the administration of large amounts of water immediately after operation, either by the mouth or rectum, or even subcutaneously in the form of saline solution. Ligation of arteries has a well-established position: ligation of the superior thyroid can often be performed with more safety than a hemithyroidectomy; ligation of the inferior thyroid is a difficult and somewhat severe procedure, and should rarely be adopted. Ligation of both superior and one inferior thyroid arteries may be quite as severe as removal of half the gland.

It is best to tie the artery close to the gland, and even to include in the ligature the upper pole of the gland itself, and to tie vein and artery together. Berry does not think that if removal of one lobe does not cure the disease the other half should be removed, but only a portion of it, as the risk of myxœdema is too great. There are persons who cannot take thyroid extract. He, like Mayo, has seen no proof that thyroid grafting can be relied on to take the place of normal gland. From these extracts it will be seen that Berry's attitude towards operation in Graves' disease has changed, and he is now more in favour of operating than formerly.

Halsted,[3] of Baltimore, in 30 cases of Graves' disease has excised the greater portion of both lobes of the thyroid gland at two or more operations. Several of these patients, operated upon as long ago as 1902 and 1903, are still under observation and in perfect health. In all cases the second lobe was removed because excision of the first had been followed by insufficient improvement. In several instances ligation of three arteries with excision of one lobe had been attended with almost negative results, and relief from all symptoms followed immediately upon removal of the remaining lobe; hence the advisability of removing the first lobe in such a manner that the second may be excised without danger of tetany. A small slice of each thyroid lobe is left, in order to protect the circulation of the parathyroid glandules. The vessels are clamped at a safe distance from the parathyroids, and ligated after the lobe has been cut away. No muscles are divided. Hæmostasis is attended to with scrupulous care, and the wounds are closed without drainage. No deaths occurred.

He thinks the thymus plays an important rôle in cases of Graves' disease. With advances in skiagraphy it has become possible to detect enlargements of the thymus too slight to be determined by percussion; it seems probable that in 75 per cent or more of the pronounced cases the thymus is enlarged. Kocher has drawn attention to the importance of lymphocytosis in Graves' disease; and Halsted has found that almost invariably the proportion of lymphocytes was increased, being as high as 65 per cent in one case. In the most serious of all, however, the percentage of lymphocytes was only 9. After operation there has been a gradual reduction in the number of lymphocytes, and apparently also in the size of the thymus.

In no single instance has tying of two, three, or even four arteries sufficed to cure the patient seriously ill with Graves' disease, though considerable improvement may follow the ligation of even a single artery. For the last two years he has tied the inferior thyroid in preference to the superior, for the following reasons. The cosmetic effect is better; if a lobe is excised later the incision is through fresh and not scar tissue; the inferior artery is larger, and the effect of ligation may be greater; if a lobe is removed later, when the superior artery is tied, all four arteries will have been occluded; the position of the inferior artery is less variable than that of the superior. The inferior thyroid is ligated as follows: A transverse cut from 4 to 4·5 cm. in length is made over the tendon of the omohyoid muscle precisely in the line of the Kocher collar incision; the fibres of the sternomastoid muscle are separated in the line of the common carotid artery at the level of the omohyoid tendon. The thyroid lobe is exposed behind the posterior fibres of the sterno-thyroid muscle, and drawn inward by a retractor designed for this purpose. The common carotid is retracted outwards by a similar though somewhat shorter instrument, and the layers of fascia covering the inferior thyroid artery are divided at the level of the omohyoid tendon. The dissection is carried out by means of two long delicate blunt dissectors. A special aneurysm needle is used for carrying the fine silk ligatures around the artery, and the wound is not drained.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1913, ii, 10; [2]*Ibid*, 88; [3]*Lancet*, 1913, i, 583; [4]*Ann. Surg.* 1913, ii, 178.

THYROIDITIS.

Herbert French, M.D., F.R.C.P.

ETIOLOGY.—Acute non-suppurative thyroiditis is met with not only in Brazil, as described by Chagas (*see* GOITRE, ENDEMIC), but also in Europe; and in support of the view that it owns a microbic cause is the fact that whereas most cases subside spontaneously, a few go on to abscess formation; whilst in support of the further view that it may have several different microbic causes, is the fact that it may follow or be associated with, such various maladies as acute rheumatism, diphtheria, erysipelas, parotitis, orchitis, erythema nodosum, typhoid fever, malaria, syphilis, and tuberculosis. Robertson[1] collected and analyzed 96 cases, and over a score of references to the literature of the subject are given by Lublinski.[2]

SYMPTOMS.—Clinically, the affection is generally recognizable without much difficulty, though it may sometimes be simulated by acute diffuse hyperplasia of the gland, inflammation of the lymphatic glands in the immediate neighbourhood, hæmorrhage in the thyroid, or a rapidly growing malignant tumour of the organ. The onset is generally sudden, with pyrexia and often a rigor; there is a feeling of severe illness, with vomiting, and aching of the head, especially behind the ears and in the occipital region. The pulse is full and hard, between 100 and 120; the temperature is remittent, and may rise as high as 104° F. Often on the first day, but otherwise not later than the second or third day, an uncomfortable feeling of tightness in the front of the throat develops, with pain that is increased on movement of the neck; and simultaneously the thyroid gland can be felt to have swelled, generally as regards one lobe more than the other; occasionally the isthmus alone may be involved. The swelling is acutely tender, firm rather than elastic, and the skin over it feels hot though it is seldom reddened, and always movable over the tumour, whilst the trachea and larynx are surrounded by the latter and united firmly to it. Subjectively, besides the oppression and feeling of tightness, there are pains which radiate widely from the primary focus to the ear, the back of the head, and the shoulders. There is an extreme sense of suffocation, with wheezy breathing and irritating cough, the sputum being mucoid and often blood-tinged. Paralysis of a recurrent laryngeal nerve is not uncommon; it occurred in four out of eleven of Labbinski's cases. The cervical sympathetic is also apt to be interfered with, leading to ptosis and increased sweat secretion on the most affected side.

These symptoms attain their maximum about the end of the first week, and then they subside gradually; the remittent fever ceases, the tension decreases slowly, but there is generally some sense of abnormality in the neck for several weeks after; in addition to which, when the inflammation has subsided on one side it may repeat itself upon the other. The prognosis is favourable.

Treatment.—No operative measures are required as a rule; exceptionally, **Tracheotomy**, or division of the isthmus, may be needed. As a rule it does not pass on into suppuration, though this is of course, a possibility.

References.—[1]*Lancet*, 1911, i, 930; [2]*Med. Press*, 1911, i, 843.

TINNITUS (Noises in the Ear). *Geo. L. Richards, M.D.*

Wittmaack[1] finds this one of the most troublesome of aural symptoms. He advises that, before treatment is undertaken for these noises, a careful search for the underlying cause be made. Some are circulatory in character, and in many cases are directly transmitted, as from aneurysm, increased blood-pressure, anæmia, and cardiac diseases. The treatment should be directed to the cause only. In another class the noises are of a nervous type, and the patient is best treated by having in his room some clock or watch which, by very loud ticking, will take away the annoyance of the tinnitus. The device which produces a sound nearest to that of which the patient complains is the best. The patient should sleep in the noisiest room in the house, and after a time becomes impervious to the aural noises.

The group of cases in which the noises are dependent upon changes in the sound apparatus itself are of two classes, those depending upon pressure in the external canal (e.g., cerumen), and in the causation of which all the acute and chronic affections of the middle ear may be concerned. Noises dependent upon morbid processes in the internal ear may be caused by the degeneration of the sound perceiving apparatus itself, and the nerves directly therein concerned. The noises vary greatly in character. The treatment of these two classes must have for its basis the original causes so far as can be determined. Various medicines, such as quinine and salicylic acid, may produce ear noises. The prolonged use of alcohol and nicotine, organic nerve affections such as tabes, and constitutional diseases such as nephritis, diabetes, pernicious anæmia, leukæmia, and the like, may be the cause.

Remedies which lessen the sensitiveness of the nerve apparatus are the **Bromides and Valerian.** When no specific cause can be determined, it may be of advantage to use **Iodine, Pilocarpine, Arsenic,** or **Thyroid** preparations. The best **Hydrotherapeutic** methods are bathing the feet in hot water and the **Sitz Baths.** Reactive hyperæmia may be produced by **Massage, Bougies, Electrolysis, Hot Air** applications, the **Electric Current**, and the like. It is only after careful consideration of all the factors in the case that the noises can be properly treated; even then in many instances the results are far from satisfactory, and the question of complete destruction of the labyrinth may have to be considered if the noises are sufficiently annoying to the patient.

Fowler[2] has obtained some relief from cases of tinnitus by the application of a **Tight-constricting Neckband**; this gives relief by increasing the labyrinthine pressure or by relieving the under-tension in the middle ear, which is brought about by the congestion outbalancing the weighing effects of this congestion on the middle-ear mechanism. In neurasthenic patients, relief from the tinnitus comes after wearing the neckband for long periods of time, whereas in non-neurasthenics relief is afforded as long as the neckband and other appropriate treatment is continued. Tinnitus in otosclerosis is influenced sometimes by the increased labyrinthine pressure induced by the neckband, but rarely by the increased pressure in the external meatus. In nerve deafness, a neckband will diminish tinnitus unless its determining factor is extralabyrinthine, in which case it will but rarely lessen it. In chronic non-suppurating otitis, if a constricting neckband increases the tinnitus, the determining factors are mainly in the middle ear, and are more or less influenced by treatment, according to the character of the lesions. If a constricting neckband diminishes the tinnitus, the determining factors are either in the labyrinth or its walls, and are due to reflex irritations or to general conditions, such as anæmia or neurasthenia, with or without accompanying middle-ear lesions. Prognosis in these cases is better than might be expected. If meatus closure and the constricting neckband have no effect on a marked tinnitus, the results are negative, and sclerotic conditions probably exist. If the neckband diminishes tinnitus, and increased air-pressure in the external auditory canal has no effect, there is probably extreme ankylosis or otosclerosis.

Frazier[3] suggests the intracranial **Division of the Auditory Nerve** for the relief of such cases of tinnitus aurium as are so severe as to cause grave neurasthenia or serious mental disturbance. The appropriate cases are of labyrinthine origin, and may originate in the vestibular ganglion, the cochlear ganglion, or in both; and as there is no means of separating the vestibular from the cochlear division, the entire auditory trunk must be sacrificed. Cases of central origin must be excluded. The best cases are those in which there is loss of air-conduction with preservation of bone-conduction, and a low-pitched tinnitus. Complete deafness is one of the obstacles to be considered, and, as a rule, the patient is already deaf on the affected side. For the detailed technique the reader is referred to the original article. The operation should only be done by those who are familiar with the problems of the surgery of the posterior fossa.

REFERENCES.—[1]*Deut. med. Woch.* 1912, Sept.; [2]*Laryngoscope*, 1913, Mar.; [3]*Jour. Amer. Med. Assoc.* 1913, Aug.

TONGUE, CANCER OF. *Priestley Leech, M.D., F.R.C.S.*

Gosse and Dupuich[1] report the case of a patient with epithelioma of the tongue at twenty-two. There was no history of syphilis, and the Wassermann reaction was negative. The disease was removed, but recurred some months later. Lorsin, out of 342 cases of cancer of the tongue, found 9 between fifteen and thirty years of age. Histological examination is the only means of making a certain diagnosis. They give a résumé of the literature of thirty cases in young subjects so far reported.

REFERENCE.—[1]*Rev. de Chir.* 1913, 295.

TONGUE, MARGINAL RESECTION OF. *Priestley Leech, M.D., F.R.C.S.*

Sampson Handley[1] has given this name to an operation designed and practised for some years by the late Sir H. T. Butlin. It is very useful in two classes of cases: when the tongue is originally, or has become, too large for the mouth, and when its lateral margin shows dangerous or annoying irritability in contact with the teeth. Its advantages are that the tongue becomes reduced in size without altering its shape, impairing its mobility, or interfering with speech; the teeth after the operation lie no longer in contact with a papilla-bearing surface, but with smooth mucous membrane derived from the inframarginal surface of the tongue; and owing to the reduced size of the latter, its contact with the teeth is not so intimate.

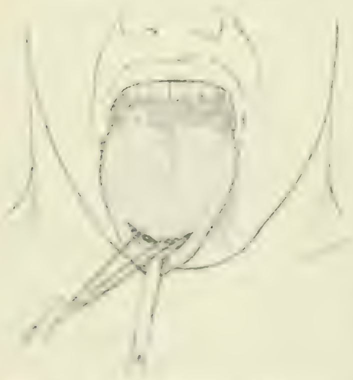

Fig. 70.—Marginal resection of the tongue. First stage of operation.

The *technique* is as follows. The tongue is transfixed far back by a stout silk ligature which helps to control it. The excision of the wedge is commenced at the tip of the tongue, and at first involves two converging incisions about an inch and a half in length; sutures are then introduced (*Figs.* 70, 71). The bleeding is thus stopped, and the tongue can be manipulated by a loop of tissue, shortly to be

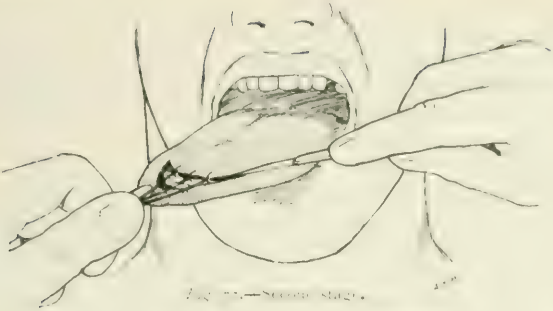

Fig. [illegible].—Second stage.

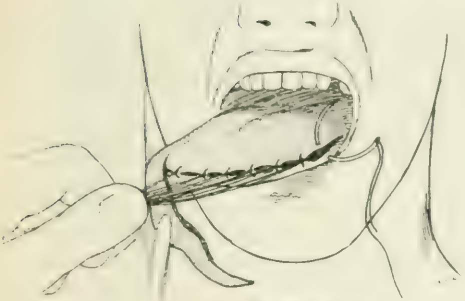

Fig. [illegible]. Third stage.

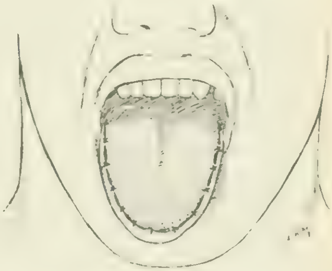

Fig. [illegible].—The operation completed.

removed, but still attached at both ends like the handle of a handbag. Making traction on this handle, a further portion of the marginal wedge, perhaps an inch long, is now cut along the margin of the tongue, and again stitches are introduced; the same manœuvre is repeated on the opposite side, and again repeated, until the sutures have been placed right back to the last molar tooth, where the V-shaped notch is made more and more shallow until the posterior end of the wedge is entirely free on both sides and comes away. By this method hæmorrhage is reduced to a minimum and the performance of a laryngotomy is avoided. In

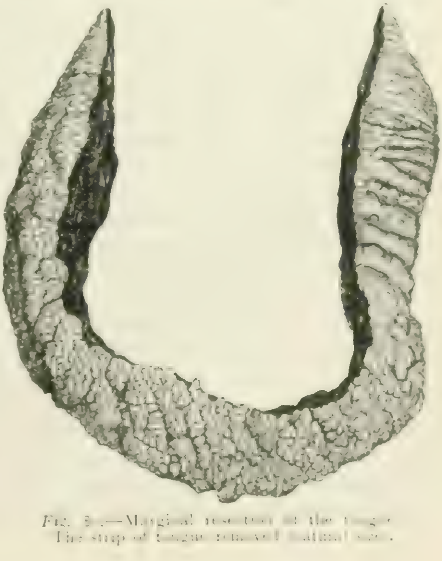

Fig. [illegible].—Marginal resection of the tongue. The strip of tongue removed (natural size).

excising the wedge, the lower of the two incisions accurately follows the junction between the rough mucosa of the dorsum and the smooth mucosa of the inframarginal portion of the tongue, so that none of the latter is sacrificed. Notes of two cases are given in which this operation was performed.

REFERENCE.—[1]*Brit. Jour. Surg.* 1913, July, 42.

TONSILS. (See also ADENOIDS.) *W. G. Porter, M.B., F.R.C.S.*

Hett,[1] as a result of his studies in the anatomy and comparative anatomy of the tonsils, finds that they normally atrophy before adult life, and so cannot have a function in adults; and that in the throats of the healthiest children they have begun to atrophy at or soon after five years, while if they remain they are either functionless, owing to the preponderance of fibrous tissue, or so grossly pathological as to be a source of danger rather than protection. He concludes that where operation is necessary, enucleation is the method of choice.

Albuminuria in Association with Diseased Tonsils.—Baines and Campbell[2] have made an examination of the urine from 750 patients who were to be operated upon for diseased tonsils. Of these, 24, or 3·2 per cent showed albuminuria; in 19 this was associated with casts; in 22 it disappeared in from one to six weeks after the operation; while in the remaining 2 it persisted after eight and twelve months respectively.

The Relative Value of Tonsillotomy and Tonsillectomy.—This is a subject which still gives rise to much discussion, and its importance was recognized at the recent International Medical Congress where it was chosen as a subject for debate. J. L. Goodale, in his report, enumerates some of the reasons justifying the assumption that the system may dispense with the tonsils without detriment. First, if the tonsils furnish something of value to the body, the other aggregations of lymphoid tissue in Waldeyer's ring must have a similar function. Furthermore, in the last few years tonsils have been excised without ill effect on the system. If we admit that tonsillotomy often fails to accomplish the result desired, why is not tonsillectomy always the operation of choice? Here the question of technique is of the greatest importance. Goodale, after a preliminary injection of morphine and atropine, operates on the patient in a sitting position under ether, and uses a head light; a small sharp tenotomy knife is used to dissect out the tonsil down to the tonsillar artery, and the snare is employed to perform the final separation. Hæmorrhage, in his experience, is slightly more frequent than after tonsillotomy, but is readily checked. Of the two operations, tonsillectomy shows a larger percentage of septic complications. As regards subsequent deformity, if the tonsillectomy be skilfully performed it should not occur; and while gross deformities are unlikely to occur after tonsillotomy, yet cicatricial occlusion of the lacunar orifices is frequent, and may lead to an intensification of the original chronic inflammation.

The indications for operation should be determined by the pathological changes of the tonsils which are actually injurious to the individual. Simple hyperplasia, if obstructive or favouring catarrhal conditions, and if persistent, may be sufficiently treated by a tonsillotomy, especially in children. Recurrent infections and local tuberculosis of the tonsils require complete tonsillectomy. In the case of singers, if beginners, a partial or complete removal of the tonsils may usually be done if the local condition demands it, but with increasing length of singing experience a conservative attitude should be maintained.

Whale[3] has compared the *remote results* of 110 tonsillotomies, and a similar number of tonsillectomies. In cases where there had been voice troubles, the best results were obtained after tonsillotomy, 15 being cured out of 26; while in 29 cases subjected to tonsillectomy, 14 were cured. Where lymphadenitis was present before operation, 43 per cent of cases were uncured by tonsillotomy, 33 per cent by tonsillectomy. As regards hæmorrhage after operation, only 1 case occurred after tonsillotomy and 8 after tonsillectomy. Deformity was found to occur in 21 per cent of cases after tonsillotomy, and in 23 per cent after tonsillectomy; but harmful deformity was commoner after the latter. The author concludes that the disadvantages of tonsillotomy are: (1) Initiation of either tonsillitis, or lymphadenitis, or both; (2) Recurrence of the trouble for which the operation was performed. The disadvantages of tonsillectomy are the risk of: (1) Serious hæmorrhage at operation; (2) Harmful deformity; (3) Voice trouble. Thus tonsillectomy is the more dangerous operation, but more likely to cure the disease.

Sheedy[4] examined 50 patients, operated upon elsewhere, two or three months after enucleation of the tonsils by various methods. He found deformed throats in 40; of these about 5 per cent complained of difficulty in using certain words, and had nasal intonation, and 2 had practically lost the singing voice. The deformities were of three varieties. In the first, the pillars of both sides seemed to have disappeared, leaving a flattened surface and a narrowed opening into the nasopharynx. In the second, the two pillars had joined, and the uvula was pulled to one side or the other. In the third variety, the anterior pillar had totally disappeared, and a large amount of cicatricial tissue was deposited on the surface of the posterior pillar, which had altered its shape and function. To avoid deformity, the author inserts a tonsil tenaculum as far as possible into the centre of the gland, which he endeavours to invert; when this is achieved, a snare is passed over the tonsil, which is then removed by slowly tightening the snare, taking from two to three minutes. He has never seen deformity follow this method of operation.

Technique of Tonsillectomy.—Sluder,[5] as a result of more extended experience, believes he can remove 99·5 per cent of tonsils by his guillotine, making use of the alveolar eminence of the lower jaw. His instrumentarium has been modified owing to the difficulty some operators found in making the dull blade cut through the tissues. He has added to the power of his original pattern by means of what is described as a mechanic's "dog" (*Fig.* 81). It consists of a lever with a hook on the distal end, which is engaged in a hole made in that part of the shaft which becomes exposed after the blade has been pushed across the aperture. At the point of the thumb-piece an arm 2½ in. long is given off at a right angle. As the "dog" is applied, the thumb-piece is engaged just under the tip of the arm. The shaft of the lever is then pushed down to make it lie parallel to the shaft of the instrument. This may be done with one hand, as shown in *Fig.* 82. The squeezing power of this leverage will be found to be very great.

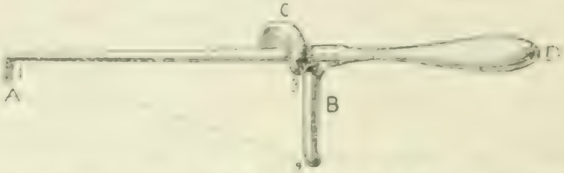

Fig. 81.—Mechanic's "dog." A, [illegible] B, [illegible] C, [illegible] D [illegible]

George L. Richards[6] operates with the patient in the upright position, and prefers finger dissection. The tip of the finger is inserted between the anterior pillar and the tonsil capsule, detaching the upper third of the latter, the finger being then inserted between it and its attachments to the superior constrictor muscle and the adjacent fascia. It is then grasped with forceps and removed with a snare. General anæsthesia should be employed. Corwin[7] is a warm supporter of Sluder's method. As an adjunct he uses a pair of tonsil hæmostats, one is applied immediately the first tonsil is removed. He prefers general anæsthesia with gas and oxygen. Carter[8] uses a tenaculum consisting of two spiral prongs attached to a slender shaft, which is engaged in the tonsil, and is then pulled towards the median line; a sharp tonsil separator is used to free the anterior and posterior pillars. The final separation is carried out by Eve's snare.

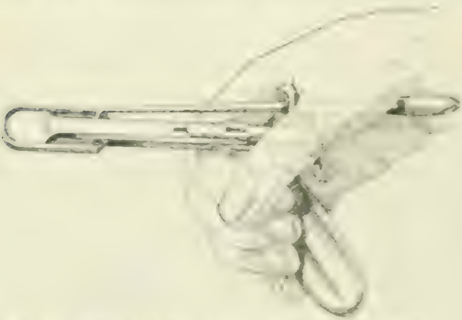

Fig. 82.—Method of [illegible]

Halle,[9] to avoid *reactionary hæmorrhage*, searches for the bleeding points immediately after enucleating the tonsils, seizes them with artery forceps, and twists them, ligature being unnecessary. For very severe hæmorrhage, he stitches the faucial pillars together or uses clips. Skillern,[10] in view of the increasing number of tonsil operations, advises that a careful examination should be made in each case before operating, to see that the internal carotid artery has not an anomalous course. If it has, it may be seen pulsating in the pharynx in close relation to the tonsil. If operation be essential in such a case, a preliminary ligature of the internal carotid should first be carried out.

Complications after Tonsillar Operations.—Koplik[11] has observed that after operations on the tonsils (tonsillotomy or enucleation) certain forms of infection are apt to arise. He distinguishes three types: (1) A form which runs an obscure fever for a week or more without causing endocarditic or other lesions; (2) Those cases which show pyrexia, and combine with it endocarditis, which may have a fatal issue; (3) A form of sepsis in which the infection is severely hæmolytic, and causes destructive blood changes with signs of sepsis, such as profuse hæmorrhagic ecchymotic areas on the skin, severe hæmorrhages from the bowel, and areas of bronchopneumonia.

REFERENCES.—[1]*Brit. Med. Jour.* 1913, i, 743; [2]*Amer. Med.* 1913, 410; [3]*Lancet*, 1913, i, 444; [4]*Med. Rec.* 1913, i, 654; [5]*Jour. Amer. Med. Assoc.* 1913, i, 650; [6]*Ibid*, ii, 1231; [7]*Ibid*, 1243; [8]*Med. Rec.* 1913, i, 986; [9]*Deut. med. Woch.* 1913, 368; [10]*Jour. Amer. Med. Assoc.* 1913, i, 172; [11]*Amer. Jour. Med. Sci.* 1912, ii, 30.

TORTICOLLIS, CONGENITAL.

Frederick Langmead, M.D., F.R.C.P.

D. M. Greig[1] records the case of a family in which congenital wry-neck occurred in three generations. The family consists of father, mother and four children, two of each sex. Congenital wry-neck occurred in the children's maternal grandmother, the mother (an only child), the second child (a girl), and the youngest (a boy). In each of the four cases the torticollis is left-sided. No abnormality of the bones was seen by *x*-ray examination. Greig suggests that the condition may be due to hereditary transmission of some slight pelvic defect in the mothers, with a consequent tendency to malposition of the fœtus in utero.

REFERENCE.—[1]*Brit. Jour. Child. Dis.* 1913, 337.

TRIGEMINAL NEURALGIA. (*See* NEURALGIA.)

TRYPANOSOMIASIS.

Leonard Rogers, M.D., F.R.C.P.

In a discussion on this subject at the British Medical Association,[1] J. W. W. Stephens and H. B. Fantham described a new form of trypanosome from a case of sleeping-sickness from Rhodesia, which is characterized by the nucleus being situated at the posterior end of the organism near the blepharoblast in some of the stumpy forms. They have named it *Trypanosoma rhodesiense*. In two further papers, the same authors [2, 3] record the results of a large number of measurements of their new trypanosome compared with those of *T. gambiense* and *T. brucei*. They found that *T. rhodesiense* more closely resembles the latter than the former, although it can only be clearly distinguished from that of the original form of sleeping sickness by the posterior situation of the nucleus. C. M. Wenyon,[3] however, has found a posterior nucleus in *T. pecaudi*, originally obtained from a donkey in the Sudan, and thinks this character insufficient for distinguishing species. He remarks that some authorities regard *T. pecaudi* and *brucei* as identical. Mesnil[4] confirms the results of Stephens and Fantham in differentiating the Rhodesian form of human trypanosome, although he finds it to be more closely allied to *T. gambiense* than any other variety. A. Kinghorn and W. Yorke[5, 6] describe a number of trypanosomes found by them in wild game, or obtained by feeding wild tsetse flies on monkeys in north-eastern Rhodesia. At least 37·5 per cent of wild buck harbour parasites. They describe still another new trypanosome of game, which they call *T. ignotum*. Two further reports have appeared by the same workers[7, 8, 9] including their final report from Rhodesia. They show that the development of *T. rhodesiense* in *Glossina morsitans* is greatly influenced by temperature, high degrees (75° to 85° F.) being favourable, while lower ones (60° to 70° F.) are unfavourable. At such low temperatures, however, the parasite may survive in an incompletely developed stage for at least sixty days, and subsequently complete its development to an infective stage if placed in a favourable temperature, thus explaining some recorded long-latent periods of infectivity of the flies. The relative humidity of the atmosphere did not appear to influence the development. They proved that *Glossina morsitans* transmits *T. rhodesiense* in nature, and that a considerable proportion of local game was infected by it. The organism first develops in the gut, but it is not until the salivary glands are invaded that the flies become infective, the latter form being smaller and shorter than the intestinal stage, but both are infective when inoculated into healthy animals. Coloured plates illustrate the final report.

David Bruce, D. Harvey, A. E. Hamerton, and Lady Bruce publish two further reports on their investigations in Nyasaland.[10, 11] They made a large number of measurements of the lengths of five strains of human trypanosomes. Two of the curves so obtained corresponded with those of Stephens and Fantham, while three approached more nearly the type described by Kinghorn and Yorke. The percentage of posterior-nuclear forms differed widely in various strains of *T. rhodesiense*. They conclude in the first paper that evidence is accumulating to show that *T. rhodesiense* is identical with *T. brucei*. In the second report they test this important supposition further, and for that purpose obtained a strain of nagana from the same spot in Zululand where David Bruce first discovered it, and were surprised to find quite as large a proportion of posterior-nuclear forms as in *T. rhodesiense*; so they conclude that the two are identical, and that the new human trypanosomiasis of Nyasaland is nagana. They also record further examinations of game for infection, which showed that the waterbuck, hartebeest, reedbuck, and duiker are dangerous enemies to man, and the eland, kudu, bushbuck, and buffalo to cattle, goats, and sheep. Their results in wild animals closely correspond to those of Kinghorn and Yorke. They thus reach the very important conclusion that in areas in which tsetse fly abound, these wild animals should no more be protected by game laws than mad dogs should be in England, but on the contrary, active measures should be taken to rid the fly-infested areas of them, although this is unnecessary where the disease-carrying flies do not exist. W. Yorke[12] also advocates the destruction of big game as a preventive measure against sleeping sickness.

G. H. F. Nuttall[13] has published an instructive review of trypanosomiasis, dealing both with human and animal diseases, and with the work of Minchin and Thompson on the transmission of *T. lewisi* of rats through the rat flea. He points out that our present methods of differentiating species are lacking in precision, trypanosomes varying greatly on passage through different animals, while immunity reactions are not a safe basis of classification.

L. E. W. Bryan[14] has described a trypanosome-producing disease in man and in dogs and goats, all of which gave very similar measurements. (It appears probable that this is *T. rhodesiense*.)

TREATMENT.—M. Gamble[15] reports several cases of sleeping sickness in the Portuguese Congo, which have apparently been cured by prolonged treatment with **Atoxyl,** 16 out of 35 remaining in good health for from three and a half to four years. Either 4 gr. daily or 7½ gr. twice a week are injected. He does not mention the occurrence of optic neuritis. On the other hand, Werner[16] failed to save a patient with *T. rhodesiense* by atoxyl and tartar emetic injections, this form appearing to be much more virulent than the Uganda one. The man became blind, and two days before death trypanosomes were easily found in the spinal fluid.

W. Kolle, O. Hartoch, M. Rithermundt, and W. Schurmann[17] have tested a new compound, **Trixidin** (30 per cent emulsion of antimony trioxide in oil), against strains of nagana and sleeping-sickness trypanosomes. Intramuscularly in doses of 1 mgram it certainly cures infected mice, and is practically non toxic. They also found that valuable results could be obtained by inunction of **Metallic Antimony** in animals infected with trypanosomes, which they compare with mercury inunction in syphilis. They think the antimony may be altered into a more active substance in passing through the skin. This method is now being tried in cases of sleeping-sickness and trypanosome infections of animals.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, 99, 1182; [2]*Ann. Trop. Med. and Hyg.* 1912, 181; [3]*Ibid.* 269; [4]*Jour. Trop. Med. and Hyg.* 1913, Jan.; [5]*Ann. Trop. Med. and Hyg.* 1912, 301; [6]*Ibid.* 317; [7]*Ibid.* 1913, 301; [8]*Ibid.* 317; [9]*Brit. Med. Jour.* 1912, ii, 1625; [10]*Proc. Roy. Soc.* 1913, B. 285; [11]*Ibid.* 269; [12]*Brit. Med. Jour.* 1913, 9, 1315; [13]*Johns Hop. Hosp. Bull.* 1913, 83; [14]*Jour. Trop. Med. and Hyg.* 1913, GGC, 113; [15]*Ibid.* 1913, 81; [16]*Deut. med. Woch.* 1913, 261; [17]*Ibid.* 825.

TUBERCULOSIS, CLINICAL PATHOLOGY OF. *Oskar C. Gruner, M.D.*

The detection of *bacilli in the blood-stream* has received much attention during the past year, and different methods have been devised. Rogers and Murphy[1] investigated fifty cases of tuberculosis of different grades by the Kurashige-Schnitter method, which consists in adding 1 c.c. of blood taken from the arm to 5 c.c. of 3 per cent acetic acid. The mixture is centrifuged for half an hour, and the top liquid poured off, while the sediment is dissolved in 5 c.c. of concentrated antiformin; 5 c.c. of absolute alcohol are added. The mixture is again centrifuged for half an hour, the deposit is washed with distilled water, again centrifuged, and then slides are prepared.—[A large amount of time is spent in a technical procedure whose value is not substantiated by the majority of investigators.—O. C. G.]

Bachmeister[2] refers to finding tubercle bacilli in the blood of healthy persons, and insists that this is a manifestation of pseudo-tuberculosis. The only means of distinguishing the two is by the introduction of material into a guinea-pig sensitized with a previous dose of tuberculin. Kahn[3] states that the stroma of red cells, even fibrin after treatment with antiformin, may simulate tubercle bacilli. Fränkel,[4] Göbel,[5] and others adversely criticise the test originally advocated by Rosenberger in 1909. Brandes and Mayer[6] consider that the fault does not lie with the facts but with the observers, as they discovered that Bachmeister used rabbits and not guinea-pigs for his controls; and in criticising the interpretation of the red stain of the bacilli, they state that true bacilli take a red and false ones a violet stain. A very careful study of the subject, however, was made by de Verbizier,[7] who came to the conclusion that it was quite erroneous to believe that blood of tuberculous patients contained bacilli in even as much as a quarter of the cases. The bactericidal power of the blood serum is adequate even in such patients.

Tubercle Bacilli in Urine.—E. Löwenstein[8] refers to the important circumstance that, in a number of cases in which the bacilli appear in the urine after removal of the testes, they come from the prostate, even though there are no symptoms of tuberculosis in that organ.

Staining Methods.—Macalister[9] gives a list of the staining methods applied to the examination of sputum. He states that Much's method is not suitable for routine use because so many other organisms take up the stain besides tubercle bacilli. He considers that the remarkable granular structure of tubercle bacilli is due to some artefact. Herman's method, using 3 per cent crystal violet in 95 per cent alcohol mixed with 3 volumes of 1 per cent ammonium carbonate as mordant, and staining with this for a few minutes, washing, treating with 10 per cent nitric acid and then absolute alcohol, and counter-staining with 3 per cent chrysoidin, is useful for bringing out metachromatic spore-like granules and branching forms. The original Ziehl-Neelsen method is a long way the best. Horace Wilson,[10] however, is very much in favour of the *[illegible]* method, specially for urine. It runs as follows: Stain with carbol fuchsin, warm, but without too much heat; pour off the stain without washing, and pour on picric acid alcohol (consisting of equal parts of saturated solution of picric acid and alcohol); after three seconds wash with 60 per cent alcohol; treat with 15 per cent nitric acid till yellow (thirty seconds), wash again with 60 per cent alcohol, counterstain with picric acid alcohol till lemon-coloured, and wash with distilled water, and dry gently at a low heat. The bacilli are thrown out very conspicuously against the yellow background. —[One cannot but feel that there is a great amount of time wasted on other staining methods, considering the absolute soundness of the Ziehl-Neelsen process, especially as aided by antiformin, by means of which, in material containing even only two or three organisms, these are readily secured under the microscope.—O. C. G.]

Leucocytosis.—Holroyd[11] recommends the *examination of the blood by Arneth's method* (*see* MEDICAL ANNUAL, 1912). Using the classification of leucocytes into five groups with the percentages 5, 35, 41, 17, and 2 respectively, he finds that cases of tuberculosis invariably show marked increase of the first two groups at the expense of the remaining three. Analyzing his figures, we find the average to be thus—32, 40, 23·3, 4, and ·7 respectively. The great increase in the first two groups is the essential feature. As improvement takes place, the deviation to the left is less marked.

Serum Diagnosis.—The value of complement fixation in tuberculosis is dealt with by Dudgeon, Meek, and Weir.[12] Antigens used are extract of sputum, tissues, and various tuberculins and tubercle bacilli. In every case where a patient was under treatment with tuberculin, the reaction was positive. It was always negative in persons who were merely in contact with tuberculous people. Nesfield[13] could not find antibodies in acute tuberculosis. He shows the relation between the antibody content and the opsonic index, and he believes that the leucocyte is an extremely delicate test for the amount of free antibody in the serum.

Fagnoli[14] describes a method of applying Ascoli's thermo-precipitin reaction for the diagnosis of tuberculosis of the lungs. The test may become positive even if the bacillus cannot be found in undoubtedly positive cases. Roughly, the test consists in mixing sputum with chloroform, incubating, and then replacing the chloroform by a saline. The filtrate is then run on to the surface of Vallée's anti-tuberculous serum, and after keeping in the incubator for half an hour, a ring should be formed at the junction line.

REFERENCES.—[1] *Jour. Amer. Med. Assoc.* 1913, i, 995; [2] *Munch. med. Woch.* 1913, 343; [3] *Ibid.* 345; [4] *Deut. med. Woch.* 1913, 737; [5] *Ibid.* 1136; [6] *Ibid.* 1137; [7] *Rev. de Méd.* 1913, i, 161; [8] *Deut. med. Woch.* 1913, 499; [9] *Brit. Med. Jour.* 1912, ii, 411; [10] *Ibid.* 413; [11] *Ibid.* 1913, ii, 927; [12] *Lancet*, 1913, i, 19; [13] *Ind. Med. Gaz.* 1913, July 256; [14] *Münch. Med. Woch.* 1913, 1480.

TUBERCULOSIS IN CHILDHOOD. (*See also* BRONCHIAL GLANDS; TUBERCULOSIS, SURGICAL.)

Frederick Langmead, M.D., F.R.C.P.

ETIOLOGY.—*Incidence.*—Modern methods of diagnosis by the specific tests and by x-rays, more careful scrutiny at post mortem examinations, and bacteriological evidence, all tend to confirm the view that tuberculosis is an extremely common disease in children. As Eric Pritchard[1] says: "Within the short compass of one hundred years, a disease almost unsuspected below the age of puberty has come to be regarded not only as the commonest of all diseases affecting childhood, but practically as a universal disease among children of the proletariat classes." To quote the figures obtained from only a few areas: Hamburger and Monti, using the tuberculin test in Vienna, have claimed a tuberculosis incidence of 90 per cent in the case of school children of 14 years of age, of 70 per cent in children between the ages of 7 and 8, and of 20 per cent during the third year. In Dusseldorf, Daske, using von Pirquet's test, found that of children of 6 to 8 years old, 40·7 per cent reacted positively; from 9 to 11 years old, 43·7 per cent, from 12 to 14 years old, 49·0 per cent. Nietner,[2] in a limited area in Germany, the Furstentum Birkenfeld, obtained positive results in between 26 and 67 per cent of the children in a rural community, and in one badly affected area, in as many as 87 per cent in the oldest girls' class. Statistics similar to those of Hamburger and Monti have been furnished by Mantoux, in Paris, and by Ganghofner, in Prague. On the other hand, as Pritchard remarks, though tuberculosis is a terribly fatal disease during the first few months of life, the mortality rate among those affected rapidly falls to about 2 per cent at the end of the fourth year. Thus children may be said to be highly susceptible, but, with the exception of the first two years of life, little liable to fatal results.

C. Paget Lapage,[3] working in Manchester, found that among 1000 hospital children, 32 per cent of those 2 years old and under reacted positively; the proportion steadily increased as years advanced, and 60·8 per cent of those between 10 and 14 years old gave a similar reaction, although 51·2 per cent of those were free from signs, symptoms or a tuberculous history. This was corroborated by x-ray examination; 56·6 per cent of the children who showed indefinite symptoms on clinical examination were found to have intrathoracic tuberculosis, healed or active, and 26·6 per cent of those free from signs, symptoms, or history also showed tuberculous lesions. The disease was nearly always at the roots of the lungs, either the bronchial glands or lung tissue, and the apices were very seldom affected.

Sources of Infection.—Nietner[4] points out that the cases which arise by direct hereditary transmission are so few that their significance is negligible in the struggle against tuberculosis. He recognizes occasional infection by tuberculous milk, but considers that such cases are comparatively uncommon, and believes them to be especially mild in character. On the other hand, the united findings of the English Royal Commission and the Imperial Enquiry in Germany, give bovine tuberculosis as the form of infection in 33 out of 133 cases. Mitchell[5] has shown that 90 per cent of the cases of tuberculous disease of the upper deep cervical glands occurring in Edinburgh are of bovine origin; and in 70 cases of bone and joint tuberculosis in children in the same city, the bovine bacillus was found in 41 by Fraser.[6]

Infection by direct inoculation is a rare event. An unusual manner in which this may occur is by the ritual of circumcision. Emmett Holt[7] describes a case of generalized tuberculosis in a baby, who died at three and a half months, in whom the infection arose in this way. It was very virulent, and the lesions were widespread. Acid-fast bacilli were found in the sputum of the man who officiated. Tuberculous nodules were found in the child's iliac artery, myocardium, and skin, as well as in nearly every organ in the body. Holt was able to find references to 40 other cases in the literature. Of the 41 patients, including his own, 10 are known to have died, 7 are reported as having partially recovered, in 12 the final results were not stated, and in 6 recovery is said to have taken place. In many of the reports, several children have been infected by the same operator. As a rule, the earliest symptoms have been observed in about a week after the operation. The wound does not heal, but suppuration and ulceration follow. The early ulcer may be anywhere on the prepuce, but is usually on the frænum. It may remain as a local condition or become generalized. By the second or third week the inguinal glands enlarge, and in many cases break down, with abscess formation. Early removal of these glands would appear to hold out the best hope of checking the infection. Most of the cases were diagnosed at first as syphilis.

Hess[8] records an interesting group of ten infants, varying in age from about two to three years, who were apparently infected by a tuberculous attendant. They were all in one ward, and were in charge of the attendant from May 15th to July 1st, 1912. All had been tested by von Pirquet's method in April, and three had given a positive reaction. About the middle of July, soon after the nurse left, all were tested again, and reacted as before. In October all gave a positive reaction, and also again in the following January. No tuberculosis could be demonstrated by clinical examination, however.

Site of the Primary Lesion.—Opinions differ as to the primary focus of the disease in children. Most English observers would agree with Pritchard,[9] who holds that the *lymphatic glands* are the seats of election. He suggests that those in the drainage area of catarrhal or otherwise diseased organs constitute zones of special danger, and that tubercle bacilli become arrested in them, whether brought directly or previously filtered through other glands. The experience of most writers agrees with that of Still, who found the thoracic glands far most commonly affected. Pritchard, however, considers that the abdominal and thoracic glands are diseased with equal frequency; and Lapage, at the Manchester Children's Hospital, found that the abdominal glands are affected often more than the thoracic glands, in the ratio of 71 to 55. Nietner states that the consensus of opinion inclines more and more to the theory that usually it is the *lung* that is the primary area of infection, an opinion which is supported by Ghon, of Prague, who found this so in 95 per cent of 184 post-mortem examinations. Mitchell[10] investigated the *tonsils* in sixty-four consecutive cases of children suffering from tuberculous disease of the upper deep cervical glands, and found evidence of tuberculosis in 39 per cent.

DIAGNOSIS.—The great disproportion between the incidence of tuberculosis in children as tested by tuberculin reactions and seen post mortem, and the frequency of its recognition clinically, is sufficient indication of the difficulty of its detection at this age. Thus, as Pritchard says, infants may be "riddled" with tubercles, and older children may have severe disease of the mediastinal or peritoneal glands, without exhibiting any serious impairment of health or constitutional symptoms. Wasting is not an essential feature until the disease is far advanced, although infants, as a rule, come to a standstill, and fail to put on weight in spite of careful dieting. The temperature shows irregularities, but scarcely ever such wide variations as are seen in adults. Sweating is a common symptom in this as in many other childish complaints, but he places some reliance on it if it occurs in older children. General lassitude, a poor appetite in the morning, and buoyancy of spirits alternating with periods of depression, all suggest tuberculosis. For evidence of enlargement of glands, all areas accessible to palpation should be examined. He lays stress on the presence of enlarged axillary glands the swelling of which cannot be explained on other grounds. Cervical glands are enlarged from so many local causes that they do not provide so useful an indication. Since enlarged mediastinal glands are so frequently present in tuberculous children, it is essential that this region should be investigated by every possible means. Pritchard gives the following as the more common signs and symptoms of tuberculous adenitis in this situation: (1) A hollow spasmodic cough, without expectoration or obvious cause; (2) Impairment of resonance, especially to the right of the sternum at the level of the second intercostal space in front, and the interscapular region behind; (3) Enlargement of the superficial veins in the upper third of the chest, especially when unilateral, on the right, and radiating from the coracoid process to the sternal end of the second intercostal space; (4) Inspiratory stridor heard universally over both lungs, due to pressure on the trachea (Still); (5) Defective entry of air into one lobe, due to pressure on the bronchus; (6) A bruit at the inner end of the clavicle on forcible extension of the head (Eustace Smith); (7) Pleuro-pericardial friction rub (rare); (8) Tracheal character of the voice heard on auscultation below the usual level of the seventh cervical spine behind (d'Espine); (9) Evidence of skiagram, distinct in advanced cases, unreliable in recent. Tuberculous glands in the abdomen are usually undetected during life; they are most often recognized in the right iliac fossa or to the left of the vertebral column at the level of the umbilicus.

A. E. L. Roche and F. G. Caley[11] emphasize the value of **X-rays** in the diagnosis of tuberculosis of the mediastinal gland or commencing at the pulmonary root. It is often argued that opacities are frequently seen in this situation, and have no special significance; but these writers are convinced of their pathological import. They examined a series of control children of about the same age, who were in good bodily health, and failed to give a positive von Pirquet reaction, and in them no opacities were seen. The shadows seen in those who reacted positively to the test consisted either of linear striation corresponding to the larger bronchi, or of an indefinite mottling, or showed a more definite circumscribed outline.

In proportion to the number of cases in which pulmonary tuberculosis is found post mortem in one situation or another, the number in which it is diagnosed during life is very small. Yet it must be remembered that when advanced chronic disease is discovered clinically it is most often *not* tuberculous. As P. L. Sutherland and A. A. Jubb[12] point out, it is more often due to chronic catarrhal conditions, associated sometimes with varying degrees of bronchiectasis, and is the chronic residue of pneumonic or bronchopneumonic inflammation, which in turn has followed measles or whooping-cough, or may have arisen *de novo*. Where dullness is elicited in such cases, it is no doubt due to fibrosis. They base their opinion on the negative results which attend examination of the sputum.

The one certain proof of active tuberculosis, namely, the discovery of *tubercle bacilli*, often proves a broken reed in the case of children, for the lesions do not commonly communicate with the bronchi, and even in definite pulmonary disease, sputum is not often obtainable. Hence the amount of reliance to be placed upon *tuberculin tests* is a matter of considerable moment. It is clear, from the great frequency with which a positive reaction is obtained, that such a reaction can help us very little, except in infants, in determining whether the particular illness from which the child is suffering is due to tuberculosis or not. A negative reaction is of greater value, for by it, with certain reservations, tuberculosis may be excluded. Lapage[13] places great reliance on Von Pirquet's test. In his opinion, although the subcutaneous method gives the highest percentage of results, this cutaneous method is the more suitable. A reaction indicates that the subject has been infected, but does not mean that the disease is progressive or active. A marked reaction in a healthy person may be of good import, and need not bear a sinister interpretation. A negative result may follow the test in children infected with tuberculosis; (1) If the disease is advanced; (2) If there is cachexia; (3) In very acute disease; (4) In mixed infections, or cases complicated by acute disease. A single negative test does not exclude tuberculosis, for on repeating it, the percentage of positive results increases by as much as 28 per cent. Even a repeated negative result does not exclude tuberculosis, for some definitely tuberculous patients react on the third attempt, and others fail to after several trials.

TREATMENT.—*Preventive.*—Pritchard dwells on the importance of prophylaxis, more especially in the first two years of life, the period when the disease is most dire. The two factors of greatest moment in successful prophylaxis are protection from sources of infection and the maintenance of strength. The most essential step is to remove young infants from an environment of open infection. Damage to the lymphatic system, by affording seats of diminished resistance, enhances the chance of a serious tuberculous invasion. Thus, all factors which predispose to catarrhs predispose also to tuberculosis; such are confinement indoors, ill-ventilated rooms, dust, excessive clothing, and too much warmth. As a protective measure against catarrhs, he recommends the graduated cold bath, the temperature of which is gradually reduced from 100° F. by one degree daily, until it is given almost cold. He advocates a varied and liberal proteid diet, whether the infant is breast- or bottle-fed, and supplements the milk diet with feedings of raw meat juice, yolk of egg, plasmon, and other easily digestible forms of albuminous food.

After the second year of life, our energies, he says, should be directed towards supporting the strength during convalescence from measles, whooping-cough, chicken-pox, and scarlet fever. At such times removal to the sea, or to bracing country air, is one of the most satisfactory and economical measures. This is urgently needed when these diseases follow each other in rapid succession with no period intervening for convalescence.

Nietner argues that since it has been demonstrated that the milk of tuberculous mothers, even when there is no evidence of mammary disease, harbours tubercle bacilli, the suckling of infants by such mothers should in all circumstances be prohibited. Cow's milk, in his opinion, should always be boiled. Like other workers, he banns the comforter, and the evil habits of kissing babies on the mouth, or washing their faces with the maternal pocket handkerchief, moistened or not as the case may be with saliva. Infection through school attendance he regards as negligible, but he attaches more importance to the possibility of infection by the teacher, urging that a thorough medical examination should be made of all candidates and that all those found to be tuberculous should be rigidly excluded.

Curative.—Nietner holds that the curative treatment is based on hygienic and dietetic methods, supplemented by the administration of **Cod-liver Oil.** Concerning the value of **Tuberculin** there is more difference of opinion. Pritchard thinks that tuberculin has a very limited usefulness, and is uncalled for in the great majority of cases. Nietner, on the contrary, states that the only cases which should be excluded from this treatment are those of children who have already reached the more advanced stages of pulmonary disease. Recommending small doses to begin with, he, nevertheless, thinks that there is at present a greater danger of giving too small doses which are ineffective, than too large which are toxic. A new method of treatment introduced by Finkler of Bonn, that of using **Methylene Blue** and various **Copper Salts**, and administering them by subcutaneous injection, by internal application, and by inunction, is too recent for criticism.

REFERENCES.—¹*Pract.* [illegible]; ²*Lancet*, [illegible]; ³*Brit. Med. Jour.* [illegible]; ⁴*Lancet*, [illegible]; ⁵Quoted by H. J. Stiles, *Trans*

viii. Internat. Congr. Med. Sect. x.; [6]*Jour. Exp. Med.* 1912, xvi, 4; [7]*Jour. Amer. Med. Assoc.* 1913, ii, 99; [8]*Ibid.* i, 1617; [9]*Pract.* 1913, i, 280; [10]Quoted by H. J. Stiles. *Trans. viii. Internat. Congr. Med.* Sect. x.; [11]*Lancet,* 1912, ii, 1501; [12]*Brit. Med. Jour.* 1913, i, 1156; [13]*Brit. Jour. Child. Dis.* 1912, 493, 532.

TUBERCULOSIS, LARYNGEAL. (*See* LARYNX.)

TUBERCULOSIS, PULMONARY.

J. J. Perkins, M.B., F.R.C.P.

DIAGNOSIS.—Fishberg[1] calls attention to a point which has become specially important in recent years owing to the search for early tuberculosis, namely, that abnormal signs at the apex may have some other cause than the tubercle bacillus. He classifies the conditions other than tubercle, which may lead to apical lesions in three groups: (1) Collapse induration, found chiefly in mouth-breathers; (2) Apical catarrhs after influenza, in the emphysematous, or in those who follow dusty occupations; (3) Apical indurations found in persons with heart lesions. Of these three groups, the first is the most important and the most frequent. One apex, usually the right, is dull and retracted, with harsh and even bronchial breathing and crepitation; the history is one of long-continued nasal obstruction and mouth breathing, with frequent catarrhal attacks, and profuse expectoration, which may even be streaked with blood. The general health, however, remains fairly good, and the patients are able to continue their work, the condition often being discovered by accident. In the mouth-breather, owing to the lack of filtration, inspired dust can of course be carried into the apex of the lung, exciting repeated attacks of catarrh, followed by fibrosis and contraction; or the induration may follow on atelectasis without any inflammation. As regards the differential diagnosis from tuberculosis, points are: the history of nasal obstruction and colds, the absence of tubercle bacilli from the sputum, even on repeated examination, the absence of fever and tachycardia, and above everything, the comparative excellence of the general health, and the absence of the fatigue and languor of the tuberculous and of persistent loss of weight. It has long been known that the combination of disease of the left heart with tuberculosis is uncommon; yet cases of mitral disease are frequently mistaken for phthisis, and abnormal signs at the apices are often found. In six months Fishberg examined 38 patients suffering from mitral disease, 27 of whom showed signs suggestive of tuberculosis at one or other apex; 22 showed crepitation or rhonchus of some kind; 5 gave a history of blood-stained expectoration, and 1 stated that he had a profuse hæmoptysis. It is evident from these figures that one should be very careful in diagnosing phthisis in the presence of a cardiac lesion. In fact, whatever the physical signs in the lung, one should accept no evidence as positive except the presence of tubercle bacilli in the sputum. Of course this group, like the previous one, will as a rule fail to show the general or constitutional symptoms which are so marked in tuberculosis.

Stoll[2] reminds us that we are too apt to think of tuberculosis as a disease of young adults. It is true that nearly one third of those who die are between 15 and 40 years, but these figures give no idea of the relative importance of tuberculosis as a cause of death at any one period. Estimated on the basis of persons living, the percentage of deaths from tuberculosis is twice as high at 65 as between 15 and 20. Pulmonary tuberculosis is apt to be overlooked in the aged because its symptoms are peculiar, and because, on the other hand, chronic bronchitis and emphysema are so common in the elderly. In them cough is the chief complaint, and other symptoms of tuberculosis are frequently slight and in abeyance for long periods. In sixteen people over 60 who came because of cough, Stoll found seven to be undoubtedly, and two possibly, suffering from tuberculosis. He quotes details of several cases in which infection had taken place many years before, and remarks that the mere fact that a cough has been present for a number of years is too often taken as a sufficient proof of its non-tuberculous nature. From his description it is evident that in several of his cases the bronchial glands were much enlarged from tuberculosis, and he finds great help from the presence in the aged of D'Espine's sign, the value of which, therefore, is evidently not confined to childhood (*see* BRONCHIAL GLANDS, TUBERCULOSIS OF). Though chronic in its course, Stoll holds that an acute extension, too often taken to be acute pneumonia, is not infrequently the cause of death.

In this connection, Jex-Blake calls attention to the frequency with which the word "influenza" is used by tuberculous patients. During the last three or four years he has carried out inquiries among his out-patients at the Brompton Hospital to gather light on the meaning of the term, and believes that in many cases the so-called influenza means an attack of acute bronchitis set up by some microbe other than *B. influenzæ*; and that in many more, "influenza" really means an acute tuberculous infection of the lungs. The former question does not concern us here, but it is interesting to note that in many countries the bacillus of influenza is no longer to be found, and when present in the sputum may be simply a saprophyte. Inman, examining the sputum of 16 cases of chronic bronchitis, found the pneumococcus in all, Friedländer's bacillus in 8, *Micrococcus catarrhalis* in 3, and a staphylococcus in 1. As regards sporadic cases of influenza, Kuhemann in 1905 could find *B. influenzæ* in only 36 out of 73 cases, even though these had been diagnosed clinically as influenza. Consequently, many bacteriologists advise that the term "influenza" should be used in a purely clinical sense. Evidently many of the attacks which pass under the name of influenza, at any rate when the term is vaguely used by the laity, must be due to the invasion of some other organism. Nor is the bacillus of influenza to be found at all commonly in the sputa of the tuberculous. For example, Inman, examining the sputum of 101 patients with pulmonary tuberculosis, failed to find Pfeiffer's bacillus in a single one. What a contrast between these figures and the statements of the patients themselves! Among 416 cases of pulmonary tuberculosis examined by Jex-Blake, only 152 failed to give some history of influenza. Among the remaining 204, 112 stated that their illness began with an attack of influenza, and 122 that they had had one attack or more of influenza after the tuberculosis had declared itself. In thirty cases they left it uncertain which of the two complaints came first. These were all patients, it must be remembered, seen in recent years, long after the great epidemics of undoubted influenza had passed away. It is very generally stated that influenza predisposes to tuberculosis of the lungs, but our author's figures makes it reasonable to suppose, as he says, that influenza is more often tuberculosis. Fever, headache, general pains, and prostration are symptoms common to the two diseases. Of course, the possibility of secondary infection compels one to admit that the invasion of other micro organisms may be the cause of these intercurrent febrile attacks; but in most instances the symptoms will be found to have their origin either in the sub-acute invasion of early tuberculosis or in an exacerbation of the existing disease.

Regarding the importance of taking a careful history in doubtful cases of early tuberculosis, Cruice[1] contributes a paper based upon an analysis of the after-course of all the cases attending at the Phipps Institute from Jan. 1st, 1907, to Feb. 1st, 1908, 163 in number, which were diagnosed as non-tuberculous. He was able to get reliable information of 50 only. Of these, 16 could be said to be non-tuberculous, 23 were undoubtedly tuberculous, and 11 had died, 4 of them from tuberculosis. In analyzing the history of these 50 cases, he divided them into two groups: the tuberculous, living or dead, and the non tuberculous, living or dead, 27 in the former group and 23 in the latter. The first conclusion he draws is the importance of going thoroughly into the history of exposure to infection, which should include not only the patient's immediate family, but his intimate associates. Too often such an inquiry is purely perfunctory, and the patient's mere " Yes " or " No " accepted as final. He insists, also, that a cough that has lasted for two months or more, and cannot be explained by the presence of some general or local condition, should be looked upon with grave suspicion. Hæmoptysis, sometimes considerable, was present in a number of these cases: in 11 of the first group and 4 of the second. Cruice holds it a safe working basis to regard all cases of hæmoptysis as of tuberculous origin until proved otherwise. Stricker, who investigated 600 cases of hæmoptysis occurring in the Prussian army, concluded that soldiers attacked with hæmoptysis without special cause are in at least 80 per cent tuberculous; in the cases in which the hæmorrhage follows the special exercises of military service, about 75 per cent are tuberculous, while in the cases which come on during swimming or as a consequence of direct injury to the thorax, about one-half are associated with tuberculosis. Dyspnœa was present in both classes, as were night sweats, loss of weight, fever, and pleurisy; but the fact that a number of those who showed these symptoms did not develop definite tuberculosis later must not be taken as undervaluing the significance of these signs.

Not all cases even of definite and active tuberculosis run a prolonged course. Fishberg[1] thinks it not unreasonable to suppose that tuberculosis, like other infectious diseases, occasionally runs an abortive course. He defines the *abortive type* as covering cases whose course is characterized by short duration, one to three or four months, and which invariably recover even without special treatment. The specific fevers are well known to abort, and on the other hand, from the number of people who are found after death to have signs of healed tuberculosis in the lung, it is clear that we should be able to trace the process in life. Neisser and Braüning have coined the term "tuberculosoid" to describe this class, and that it is not rare is shown by the fact that among 1000 persons who were treated at the Breslau clinic during ten years, 300 examples of this condition were found, examination from four to ten years later showing that they were nearly all well. Such cases, then, are those in which the lesion is circumscribed, of little activity, and quickly healing. Many of them are not diagnosed during life, their symptoms passing as "colds," though others, beginning with hæmorrhages, can be recognized. It is evident, therefore, as Fishberg says, that we must to some extent reconsider our picture of tuberculosis and its prognosis. When he started work twelve years ago as physician to the United Hebrew Charities in New York, he expected to see every consumptive succumb within a few months, unless vigorous measures were taken to check the disease and change the mode of life. As time passed on, he was impressed with the large number of tubercular patients who for various reasons were not admitted to sanatoria, but continued in their unhealthy surroundings, and who yet held their own for years. In many instances patients, recommended for sanatoria, lost their signs and symptoms while waiting for admission. Many of them had kept at work the whole of this time and had received no medical care. The following case, one only amongst several, may be taken as typical. A woman, aged 27, consulted Fishberg for hæmorrhage two weeks before, three similar profuse hæmorrhages having occurred during the previous five years. Cough, fever, malaise, night sweats, etc., were present, and 7 lb. weight had been lost within two weeks. The physical examination showed dullness, bronchial breathing, and crepitation over the right upper lobe, with tubercle bacilli in the sputum. With rest in bed for two weeks, the fever ceased and her general condition much improved. This improvement has continued during the last fifteen months, cough has ceased, and the patient has gained 18 lb. in weight. Other cases are reported which began with sharp continued hæmorrhage, though Fishberg believes this is not true of the majority. Tubercle bacilli, as one might expect, are scanty among such cases, appearing only occasionally. Indeed, in quite a number they have been absent altogether, though physical signs typical of tuberculosis have been present. Whether the benign course of these cases is due to the exceptional resistance of the patients, or to infection with an attenuated strain of organism cannot be determined.

Mitchell Bruce[6] asks: how is one to recognize these benign cases with their favourable future, at the time when one sees them. The family history is of importance in his eyes, for if the tuberculosis has been directly inherited, it will run a less favourable course. More important, perhaps, is the patient's appearance and individual constitution. In taking his case, Bruce lays particular stress on the past history of the illness. The patient may discover to us a history of tuberculosis in other parts of the body, such as the glands or peritoneum, from which he has recovered; indeed, we may ascertain that the lungs themselves have been affected years before, and that the case is one of recrudescence after long quiescence, and not one of incipient phthisis at all. The proof of recovery from active tuberculosis in the past serves as a reasonable indication of the patient's capacity to recover again.

Discussing many of the points which have been raised in previous paragraphs, and especially the importance of taking a careful history, both family and personal, Bruce quotes, as an example of the value to be obtained by this means, a case of bronchial catarrh with no more than suspicious signs at the apex, in which it turned out on enquiry that the father, the mother, and two sisters had all died from tuberculosis. As he says, practical men do not make light of facts like these, however doubtful the physical signs and however unsettled the doctrine of inheritance of tuberculosis. Hæmoptysis is one of the events one meets with in taking such a history, occurring perhaps years before, and disregarded. Very frequently, in such cases, physical signs are absent and may be so for some time, and one should not be led on that account to undervalue the danger. After a variable interval of months or years, active disease makes its appearance; as Bruce says, the conclusion is irresistible that such cases were tuberculous from the first. He gives, as an example, a man of 24 who had had a hæmoptysis; there were no physical signs in the lung; twelve months later, more than one large bleeding took place, still with no signs of the disease in throat or chest. Twelve months later still, hæmoptysis occurred again, and now bacilli were discovered in the sputum. A few months afterwards there were ordinary signs of disease at the right apex.

As regards the significance of pleurisy, Bruce allows that the percentage of cases in which an attack is followed by pulmonary tuberculosis is variously estimated by different observers. According to Clifford Allbutt,[7] it is safe to say, from a review of a large number of the statistics open to us, that of all "idiopathic" pleurisies in persons, say, over five years of age, 50 per cent are tuberculous. As regards child life, he holds the incidence to be not more than one in ten, but, on the other hand, he has remarked that in elderly persons pleurisy is often tuberculous. The figures he quotes may be taken as authoritative, but the matter is evidently one on which much difference of opinion exists. It is safer to use with Bruce the indefinite term, "large percentage," for whether the pleurisy is "latent" or marked by severe pain or effusion, it is too frequently followed by disease of the lung at an interval which varies widely from a few months or even less to twenty years. Examples of the interval quoted by him from cases of his own are three, five, eight, twelve, fifteen, and twenty-one years. The truth of this sequence has only been recently established, and is still very readily overlooked. The treatment which he adopts for these incipient cases is twofold: some he sends to sanatoria, others are allowed to continue treatment in their own homes, but those who are not sent into a sanatorium are still distinctly informed that they are to regard themselves as subjects of tuberculosis, and must submit to home sanatorium life and other methods of treatment for the disease.

TREATMENT.—(See also LUNG, SURGERY OF; PNEUMOTHORAX, ARTIFICIAL; TUBERCULIN). Bardswell[1] reviewing the cases treated during the four years from 1907 to 1911 at the King Edward VII Sanatorium, states that during that time 704 cases were admitted in whom tubercle bacilli could be found. Dividing these cases into the usual groups, (1) early, (2) moderately advanced, and (3) advanced, he finds that 83·6 per cent of those in group 1 are well or alive; 61·6 per cent of those in group 2; only 28·5 per cent in group 3, as might be expected. The proportion of patients who lost their bacilli after an average of four months' sanatorium treatment is only 20·6 per cent. What this means is shown by the further figures, that of the 158 patients who lost their bacilli, 84·1 per cent are well or alive, while of the remaining 606 discharged with tubercle bacilli still present, only 50 per cent are well or alive. It is very encouraging, as he states, to note that the patients with well-marked disease (group 2), who lose their tubercle bacilli, have quite as good a prognosis as the slight cases (group 1) under the same circumstances. Of 70 cases in group 1 who lost their tubercle bacilli, 87·3 per cent are well or alive, and of 64 cases in group 2, 86·0 per cent. It is evident, then, that in our treatment we should be satisfied with nothing less than disappearance of the bacilli. The records reviewed by him are those of cases under pure sanatorium treatment. They are not perhaps as satisfactory as might be hoped, especially with regard to group 2. Eminent German physicians have found the combination of **Tuberculin** with **Sanatorium** treatment much more effective in clearing the sputum of bacilli than sanatorium treatment alone. It is to be hoped that the experience of the King Edward VII Sanatorium, which is now entering on a period of observation of the results of tuberculin, will be found to confirm this view.

McDuffie[2] has exhausted almost all the known methods of treatment in the effort to find some means of relief for very advanced cases. His experience seems to have been completely disappointing, until he tried the injection of a mixture of **Sodium Salicylate** and **Guaiacol** according to the following formula: sodium salicylate 37·5 per cent, guaiacol 12·5 per cent, glycerin 50 per cent; used in 30 gr. doses in 250 c.c. of sterile water, by intravenous injection. Profuse perspiration follows the injection, and with the sweating comes amelioration of all the symptoms; the appetite improves, dyspnœa is much relieved, and the general condition becomes more lifelike. The blood analysis, the weight, pulse, and respiration also show signs of improvement, and the temperature is frequently reduced to normal after four or six injections, while the death rate falls from 62 per cent to 31 per cent. He regards this mode of treatment as undoubtedly the quickest and most satisfactory of all the methods he tried for cases of secondary infection and advanced disease. He attributes much of the benefit to the elimination of toxins by the profuse sweating.

Reeve[10] has tried the treatment of phthisis by the intensive **Nascent Iodine** method (Curle) in the phthisis ward of a large Poor-law infirmary. No selection of cases was exercised, and when one remembers the class of case which finds its way into the Poor-law infirmary, it must be said that the test is an exacting one. Of his cases, 72 per cent were over the age of 40, 90 per cent were said to have a past history of alcohol, and a large percentage one of syphilis. His method shows a few slight alterations from Curle's own practice; 30 gr. of potassium iodide are given in half a pint of water at 7 a.m.; four hours later, 1 oz. of free chlorine water is given in half a pint of lemonade. This dose is repeated at two-hourly intervals until enough has been given. At first, 3 oz. of chlorine water are administered daily, and at the end of three weeks the dose is increased to 4 oz. and later to 5 oz. The signs of iodism are produced, cold in the head and headache, but in only two cases were these symptoms severe. On examining the urine, iodine was found to be present in all patients the following morning. At first the chlorine water caused some vomiting, but this disappeared when it was given between meals. A striking improvement in cough and expectoration was noticed, the purulent character gradually changing to mucoid, and the quantity diminishing on the average from 4 oz. in the twenty-four hours to 1 drachm. About the third week blood appeared in the sputum, and there were nine cases of hæmoptysis, but not sufficient to cause intermission of the treatment. In a number a considerable gain in weight followed. As regards temperature, there was an initial rise in nearly all cases, but after a week the daily remission showed a fall which continued in most cases until the normal was reached. Various skin diseases, e.g., acne and lupus, were cured or greatly benefited by this treatment, and three cases of surgical tuberculosis with open sinuses showed much improvement.

Flandin[11] has transferred to the treatment of *pulmonary hæmorrhage* the use of **Emetine**, introduced by Rogers for tropical abscess of the liver and amœbic dysentery, and claims the same brilliantly successful results. He had been struck by the immediate disappearance of blood from the motions in dysentery and from the pus of hepatic abscess under this treatment. A solution of 0·04 cgram of emetine hydrochloride in 1 c.c. of distilled sterile water is made and injected subcutaneously. Others have used the same treatment in the same dosage. The results have been *apparently* successful, except in one case of very profuse hæmoptysis. The method is evidently free from danger, and certainly worth a trial.

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TUBERCULOSIS, RENAL. (See Kidney, Surgery of.)

TUBERCULOSIS, SURGICAL.

Priestley Leech, M.D., F.R.C.S.

ETIOLOGY.—Stiles[1] returns again to the question of a more thorough control of the *milk supply* as being a factor of the greatest importance in combating surgical tuberculosis in children. He thinks Koch and his disciples committed a serious error in practically disregarding cow's milk as a source of infection in children. From researches carried on from material obtained at the Royal Edinburgh Hospital for Sick Children, Fraser and Mitchell came to the following conclusions: In 67 consecutive tuberculous bone and joint cases the bovine bacillus was present in 41 (61 per cent), the human bacillus in 23 (34 per cent), while both types were present in 3. Forty-one of the children were under four years of age, and in these 78 per cent were due to the bovine bacillus. In cases where the bacillus was of the human type, there was a history of phthisis in at least one member of the family in 51 per cent of the cases. The bovine bacillus was the organism found in all the children under twelve months old, and each of these had been entirely nourished on cow's milk. Of 12 children between one and two years of age, 8 owed the disease to the bovine bacillus, and all had been brought up from birth on cow's milk. In none had the milk been sterilized.

In 72 cases of tuberculous cervical glands operated on during the past two years, Mitchell found that in 65 (90 per cent) the disease was due to the bovine bacillus, while in only 7 (10 per cent) was it caused by the human bacillus. This gives a far larger proportion of bovine infections than has been found by other observers, but the clinical histories support the pathological findings. Out of 72 cases, 58 occurred in children under five years of age, and all but 3 were cases of bovine infection. The maximum incidence occurred in the second year, and it was found that 84 per cent of the children under two years of age had been brought up since birth on raw cow's milk. Practically half the cases came from rural districts, where, as is well known, there is little or no veterinary inspection of cows. In 65 cases infected with the bovine bacillus there was not a single one in which a history of pulmonary tuberculosis could be obtained in the family. In 14 cases, however, one or more of the other children suffered from some form of surgical tuberculosis, and here evidence pointed strongly to infection from the milk supply. In the 72 cases there were only three instances in which a history of pulmonary tuberculosis could be obtained in the parents.

In 51 of the cases the tonsillar lymphatic gland was the first to become infected, and in 44 the posterior as well as the anterior group of glands were involved. In examining 64 consecutive tonsils in children suffering from tuberculous disease of the upper cervical glands, evidence of tubercle was found in 39 per cent. In 30 per cent positive results were obtained by inoculating guinea-pigs; in these the bovine organism was isolated in 12 cases, and the human in 3. The hypertrophied tonsils of 90 children without clinical evidence of glandular enlargement were examined, and 6·5 per cent of these gave microscopical evidence of tuberculous disease, while 10 per cent gave positive results when inoculated into guinea-pigs. Nathan Raw's hypothesis that all surgical tuberculosis is of bovine origin cannot be admitted, as Fraser found that 38 per cent of the tuberculous bone and joint cases contained the human bacillus; and in 71 per cent of these, one or other parent suffered from pulmonary tuberculosis. These results ought to induce the medical profession to insist on the use of **sterilized milk for the feeding of infants.**

Fraser[2] records *in extenso* the experiments referred to above. The results give a much greater preponderance of cases infected by the bovine bacillus than those previously published by other authors. This is mainly due to the fact that the patients were all under twelve years of age, and the identity of the organism was established by submitting it to the following five tests: (1) The cultural characters; (2) The morphological appearance; (3) The distinctive growth upon glycerin-egg medium; (4) The reaction upon glycerin bouillon; and (5) The result of rabbit inoculation. Of 25 cases brought up on human milk, in only 6 was the bovine bacillus found; the remaining 19 were infected with the human bacillus. These are important results, and should be studied by all interested in checking the spread of **tuberculosis.**

TREATMENT.—Hawes,[3] of Boston, U.S.A., describes an outdoor clinic for cases of surgical tuberculosis. He uses **Tuberculin** (a bouillon filtrate). While not responsible for all the good results, it is a factor for good in most cases. The patients are taught the value of good food, fresh air, etc. He laments the want of institutions for the treatment of surgical tuberculosis in America. The same lament was made in the adjourned discussion on Fraser's paper on bone tuberculosis.[4] It was stated that there were only two in this country, one near Liverpool and another in the South of England; while at Berck-sur-Mer, near Boulogne, there were five, three with 1000 beds each, and **two with 2000 beds each.**

Tubby[5] outlines a scheme for the treatment of surgical tuberculosis in children by means of seaside and country treatment in fresh air and sunshine, and regards this as the best means of combating the disease. The opinion is gaining ground that for tuberculosis in children the urban hospitals are unsuitable, and that better results are obtained by letting the children be exposed to sunshine and fresh air as much as possible. Jones,[6] of Liverpool, says the principles of treatment on which he relies are: (1) Complete physiological **Rest**; (2) Good

Nourishing Food, special importance being attached to butter, dripping, jam, and sugar, with an unlimited allowance of good milk; (3) **Fresh Air** and **Sunshine.** Children under fifteen years of age possess a very high degree of natural immunity, and operation in joint and bone disease is rarely necessary, except in advanced and neglected cases.

Lovett and Fish[7] record the general results of the Massachusetts Hospital School for Crippled and Deformed Children at Canton, and say that what may be formulated with regard to the effect of **Out-door Air** on children with surgical tuberculosis may be applied to the distinctly larger field of its effects on children in general, and probably on adults as well. Their conclusions are as follow: That even in the winter climate of New England, living in outdoor air is not attended with risk of exciting respiratory troubles, frost-bites, or pneumonia; coughs, colds, and sore throats are much less frequent than among a group of healthy boys who do not live wholly out of doors. Infectious disease has not spread among the children as early as would have been expected. After admission, weight increases faster than in normal children, and hæmoglobin also increases. Symptoms of auto-inoculation, as shown by increased pyrexia, are as a rule absent, and, in the opinion of the authors, the power of resistance and repair improves under these conditions.

Richard and Felten-Stoltzenberg[8] report the results of **Sun Treatment** by the sea in surgical tuberculosis and tuberculosis of the bronchial glands. They consider that heliotherapy will give as good results at the seaside as in high mountains. They conclude from the study of their cases that heliotherapy is a real advance in the conservative treatment of surgical tuberculosis, and can be carried out at the seaside with the best results, as in addition to sunshine a sea climate offers other valuable advantages. The treatment should, however, be carried out in carefully chosen places in buildings specially built, and the patients should be under surgical care. Alkan[9] thinks more could be done in the large cities in the treatment of bone and joint tuberculosis by sun rays; and Oppenheim[10] recommends the use of **X-rays** where cases cannot be treated by sunlight.

REFERENCES.—[1]*Brit. Med. Jour.* 1913, ii, 370; [2]*Ibid.* i, 200; [3]*Amer. Jour. Med. Sci.* 1913, ii, 111; [4]*Lancet*, 1913, i, 1134; [5]*Ibid.* ii, [illegible]; [6]*Ibid.* 1913, i, 1611; [7]*Bost. Med. and Surg. Jour.* 1913, ii, 143; [8]*Berl. klin. Woch.* 1913, 1063; [9]*Ibid.* i, 1113; [10]*Ibid.* 1113.

TYPHOID FEVER.

E. W. Goodall, M.D.

Etiology.—Though it has long been known that milk is a vehicle by which the *B. typhosus* can be disseminated, yet the number of instances in which it has actually been found in contaminated milk is not large. One such has recently been reported by W. R. Stokes and H. W. Stoner,[1] in the case of an outbreak in a suburban town in Maryland in the autumn of 1912. The milk had probably been infected by a woman employed in the dairy, who had suffered from typhoid fever two years previously, and from whose stools the bacilli were recovered.

In last year's ANNUAL a brief reference was made to the case of a winch driver on board a steamer, a "carrier" who was believed to have been the cause of twenty-seven cases of typhoid in about four years. This man was admitted into the Marine Hospital in San Francisco that his condition might be thoroughly investigated and an attempt made to free him from the bacilli. A short account of this research has been given by D. H. Currie and F. H. McKeon.[2] Observations on the stools and urine were made weekly or bi-weekly from March 28 to Oct. 14, 1912. Up to June 10, bacilli were found in the stools, but not in the urine. After June 10, both the stools and the urine were free. From April 27 to June 28, 1912, an autogenous typhoid vaccine was injected subcutaneously. From a first dose of 25 million bacilli, the number per dose was increased gradually till the final one contained 1,500 million. The first four injections produced only a local redness, without general reaction. The next four (May 19 to June 11), produced a general as well as a local reaction, though one of them was slight. The last two gave rise to rather severe local, but no general, reaction. The man left the hospital on Oct. 14, 1912, and was ordered to present himself for examination once a month for six months; the period during which he had remained free from bacilli was too short for it to be certain that he had been permanently freed.

SYMPTOMS.—An account of two cases of "*typhoid spine*" has been published by M. H. Rogers.[3] Both were examined by means of *x*-rays. Rogers thinks that "the so-called 'typhoid spine' is an osteomyelitis of the vertebral bodies, which causes lesions similar to the typhoidal bone abscesses of other bones, located in the cortex just beneath the periosteum. Other observers, however, by means of the *x*-rays, have found deposits of new bone or overgrowth."

In a very interesting paper, A. Robin, N. Fiessinger, and M. P. Weil[1] put before us an account of the *hæmorrhagic* conditions met with in the acute infections, especially typhoid fever. They occur during the early and late (convalescent) stages of typhoid, but the early and the late hæmorrhagic syndromes are entirely different from one another in their clinical course and pathology. The late syndrome is characterized by purpura of the skin of the thorax and abdomen, epistaxis, buccal and intestinal hæmorrhage, and hæmaturia. The temperature oscillates up to about 38° C. (100·4° F.), and the aspect rapidly becomes anæmic. The condition lasts for five or six days, and recovery is frequent. In the early hæmorrhagic syndrome a fatal result is nearly invariable. The cause of the late hæmorrhagic condition is attributed by the authors to an alteration in the liquid constituents of the blood, which becomes more fluid in consequence of a marked loss, during the course of the attack of typhoid fever, of certain organic substances. This alteration of the blood is shown by a lowering of its density and a sedimentation of the red corpuscles. In some cases the hæmorrhages are accompanied by erythematous eruptions. The hæmorrhagic syndrome is quite distinct from the (so-called) infectious erythemas of convalescence, which have been described by several writers, notably by Hutinel and Foisset. As for *treatment* an effort should be made to augment the density of the blood and increase the organic content. Hence they recommend **Gelatinized Serum**, and metals in the colloidal state, especially electric **Colloidal Silver**, which should be injected into a vein or a muscle.

An attack of almost every one—if not every one—of the acute infectious diseases may run its course without any notable rise of temperature. This may even occur in a disease with so long a duration as typhoid fever. Norman Flower's[5] patient was a woman aged 60 years. The illness began with malaise and diarrhœa, and in a few days the patient was compelled to take to her bed because of increasing weakness. When first seen she was exhausted, had a dry, furred tongue, and profuse diarrhœa. The temperature was subnormal. Two days later she began to wander in mind, and sank into a semi-comatose state, in which she remained for fourteen days, the diarrhœa persisting; there was moderate distention of the abdomen, but the spleen was not enlarged, nor were any rose spots seen. "From the onset of the attack until the fourth week of the disease, when complete consciousness returned, the mouth and surface temperatures were invariably subnormal, and the rectal temperature, taken twice daily, never exceeded 99·4°. During the nine days following, the mouth and rectal temperatures each reached their maximum of 99·6° and 100·4° respectively, after which they dropped again." The diagnosis of typhoid fever seems to have been made chiefly on the serum reactions, which were positive in every dilution in the third, and again during the fourth week (up to 1 in 2000). At the same time the reactions with *B. paratyphosus A* and *B* were slight, and with *B. enteritidis* (*Gaertner*) negative.

DIAGNOSIS.—According to Ch. Lesieur and J. Marchand,[6] *impaired resonance over the base of the right lung behind* is a valuable sign of typhoid fever. From an examination of 150 cases, of which 114 were undoubted cases of ordinary typhoid, 17 very mild and somewhat doubtful cases, 18 other diseases than typhoid, and 1 typhoid septicæmia with meningitis but without intestinal lesions, they conclude that the dullness is present in about 80 per cent of the undoubted cases, and in 50 per cent of the mild and doubtful. It was present in the septicæmic case. It was not found in the other diseases. The dullness is not due to any pulmonary lesion, but to hypertrophy of the liver consequent on its action in eliminating typhoid bacilli. It can be found during the febrile stage, but disappears as convalescence is established. It will reappear with a relapse. Indeed, in some cases of relapse, the dullness persists even during the period of apyrexia following the primary attack. This sign, therefore, has not only a diagnostic but a prognostic value.

According to A. D. Radulescu and C. N. Atanasiu,[7] *pain on deep palpation over the gall-bladder* is a very constant sign in early typhoid fever. The patient should lie on his back and be told to take a deep breath. The physician, standing on the patient's right, palpates the

the right hypochondriac region with his left hand placed behind and his right in front. Pressure should be made gently, but at the same time firmly and continuously, deeply, and in an upward direction. The patient will complain of pain more or less sharp; should he be unconscious there will be strong muscular resistance, and at the same time a facial expression indicative of pain.

G. C. Shattuck and C. H. Lawrence[8] give a comparative statement of the frequency of occurrence of certain symptoms in two groups of 100 cases each; those in the one proved to be typhoid, and in the other not. All the patients were over fourteen. In the 100 non-typhoid patients in whom typhoid was suspected, bronchitis, bronchopneumonia and influenza represented 29 per cent. or nearly one third of the whole, undiagnosed fevers 15 per cent. and gastro-enteritis, diarrhœa, and colitis 12 per cent. Absence of rose spots at the first examination has little weight for diagnosis. The same is true of splenic enlargement when not demonstrable by palpation, and of the Widal test when negative. A positive Widal is of the greatest importance. Typical rose spots are very important; and a palpable spleen is a valuable indication of typhoid, but is common in various conditions simulating it. Atypical rose spots are useless for diagnosis. Absence of leucocytosis in a febrile disease strongly suggests typhoid. A white count below 5,000 is a valuable indication of typhoid fever, and is unusual in conditions simulating it. A count about 9,000 is presumptive evidence against typhoid. Bronchitis has no weight *per se* one way or the other. The temperature in typhoid fever is seldom below 100° F., whereas in other simulating conditions it is commonly below 101°. In typhoid the pulse-rate is more apt to be low in proportion to the temperature than in other diseases. (These conclusions apply only to cases at the first time of being seen.)

PROGNOSIS.—H. Harold Scott[9] contributes a paper on the value of the *Widal reaction* from the point of view of prognosis as well as of diagnosis. His conclusions are drawn from a study of 1,500 specimens of blood. The standards he has employed are as follows: A serum of dilution 1–30 should agglutinate an 18-hours broth culture of the organisms in question in fifteen minutes; a dilution of 1–50 in thirty minutes, and a 1–100 in an hour. He finds that "when the reaction is marked in high dilution and early in the disease, the course of the disease is generally mild. In a case of average severity, the reaction is usually quite distinct by about the seventh day of the fever. . . . In contrast to this, the outlook is more grave when the reaction appears late." He states that in some of these severe cases a hæmorrhage will produce a marked rise in the agglutinating power of the blood within a few hours. He thinks that in some such cases benefit would result if nature were to be forestalled by a small quantity of blood being withdrawn by venesection, and the agglutinating power of the serum thus raised.

He discusses at some length the significance of the agglutination by the same serum of both *B. typhosus* and *B. paratyphosus A*. The latter organism seems to be common in Jamaica. [It is not met with in the United Kingdom.—E. W. G.]. The general conclusion to be drawn from his observations is, that if one of the organisms is agglutinated but slightly compared with the other, the reaction is a "group reaction" so far as that organism is concerned. Reactions in high dilutions with both organisms point to a double infection.

TREATMENT.—S. J. Crowe,[10] in 1908, showed that **Urotropin,** whether administered by the mouth, intravenously, or subcutaneously, was a very rapidly diffusible substance, and had a powerful germicidal effect on the contents of the gall-bladder. He found that animals tolerated large doses, and that in order to produce a fatal result in rabbits the large quantity of 10 grams per kilo of the animal's weight was necessary. He administered to the human subject doses of 4·5 grams (75 grains) a day. He treated 95 cases of various diseases in this way, and in 7 of them observed hæmaturia. Three of the 7 patients died from the disease from which they were suffering (meningitis), and an autopsy showed in each case that the bleeding has been from the bladder and not the kidneys. As in typhoid fever the gall-bladder almost invariably contains the causative organisms, it has been suggested by A. Chauffard and others that urotropin would be a valuable drug in that disease not only as a curative remedy but also as a means of freeing the gall-bladder from the typhoid bacilli and thereby preventing the patient from being a carrier. H. Triboulet and F. Lévy[11] record three cases of typhoid in which from 1 to 6 grams of urotropin (dissolved in sterile water) were administered daily, with apparently beneficial results. No obvious hæmaturia was produced in any; but in two chemical examination revealed the presence of pseudalbumin, and the microscope showed red blood corpuscles and epithelial cells from the bladder. J. Balkowski[12] treated 40 cases of typhoid with urotropin: 4 of them developed hæmaturia. One was fatal, from the severity of the disease, some days after the hæmaturia had ceased. At the autopsy it was found that there was considerable extravasation of blood into the mucosa and submucosa of the fundus of the bladder, but none into the kidneys. The dosage employed by Balkowski was about ·5 gram three or four times a day, by the mouth. Three of the 40 cases were fatal. He does not think that urotropin, at any rate in the doses he used, can be said to be a specific for typhoid, but considered that on the whole the results he obtained were favourable and encouraged a further trial of the remedy.

W. H. Watters[13] has collected from various sources and tabulated 1100 cases of typhoid fever treated by the specific **Vaccines**: 128 of these were under his own care. There were 71 deaths, or 6·4 per cent, certainly a low mortality. He speaks very favourably of the treatment, and quotes several other observers to the same effect. According to Watters[13] the dosage has varied very widely in the practice of different physicians. Some of the most convincing cases are those reported by J. S. Callison.[14] He gives six charts, which show that apparently the fever was cut short by increasing doses of vaccine given at intervals of three or four days. He begins with 500 million, and increases by 100 million at a time. A few successful cases have also been reported by B. M. Randolph.[15]

Diet.—Last year a full account was given of the method of feeding by which loss of weight in this disease was to a very large extent prevented. The plan advocated is based on Chittenden's investigations. He showed, amongst other results, that the loss of protein could be prevented or lessened by increasing the proportion of the fats and sugars in the food. The reserve fat is lost first, and afterwards the proteins. Further papers on this subject have been published by Warren Coleman[16] and M. H. Sicard.[17] The former writer discusses the weight-curves in typhoid fever. Loss of weight occurs in practically all cases, but varies greatly in extent. The severer the infection and the longer the duration of the disease, the greater the total loss. This loss of weight has been attributed to three factors: (1) Partial starvation; (2) The febrile temperature; and (3) The toxic destruction of protein.

1. It is generally admitted that the almost exclusively milk diet to which it has been customary (until, at any rate, recently) to confine the typhoid patient, has not afforded him sufficient nourishment; and that the loss of weight was due to partial starvation has been shown by the success which has attended the practice of giving a more nourishing diet, the loss of weight being much diminished and even abolished thereby.

2. That the febrile temperature may account for part of the loss of weight has been shown partly by experiment and partly by clinical observation. The most marked effect is noticed when the temperature has been continuously raised for a lengthy period.

3. It is a common belief that the toxins of the infecting micro-organisms exert a directly destructive influence upon the proteins of the body. Coleman does not discuss the truth of this belief, which does not rest on so secure a basis as do those just mentioned. He states that inasmuch as it has been found possible to bring a patient suffering from typhoid fever into nitrogen and weight equilibrium by the exhibition of a diet containing a large amount of carbohydrate and a relatively small amount of protein, the correctness of the belief does not concern us at this time. But in any discussion of weight-curves in typhoid, it is important to refer to what is known as the water-retention theory. There is some reason for thinking that in cases where weight is not lost, the maintenance in weight is more apparent than real, on account of the retention of water in the tissues. Opinions are divided, and the evidence, one way or the other, is very inconclusive. As for the influence of a diet rich in carbohydrate on the retention of water, it is well known that a poorly-balanced diet may cause variations in the excretion of water; but a well-proportioned diet does not affect the water-balance.

Referring to certain observations of his own, Coleman writes that while the proportion of the foodstuffs in the diet which he has employed has varied necessarily with different patients, and in some instances has been subject to sudden experimental changes, there has been no constant relation between variations in weight and the quantity of urine. Though water may have been retained by some patients, and have caused an increase in weight, there has been no clinical reason to think that such was the case. There has been no visible œdema, and patients have not lost weight suddenly, after diuresis, when the amount of carbohydrate in the diet was diminished during convalescence.

The writer gives charts and notes of cases to show that it is possible to maintain patients suffering from typhoid fever in weight equilibrium throughout the entire course of the disease by giving them sufficient food. [illegible]'s contribution gives further experience with high-calory diets. He has come to the conclusion that patients do much better on such diets than on milk alone. The most evident features of the high-calory feeding, he states, are the sustenance of weight and nutrition, the amelioration of hunger, and the lessened tedium of convalescence.

Not a few persons have a great dislike to milk, even in small quantities; consequently, when such an individual falls ill with typhoid fever there is considerable difficulty in getting him to take sufficient nourishment. W. N. Johnson and C. C. Watt,[18] and also I. Bram,[19] have treated a number of typhoid cases without any milk whatsoever. **Gelatin** was one of the principal items in the diet. Johnson and Watt write thus of its use in a considerable number of cases: "Great reliance was placed on gelatin, which was given almost *ad libitum*. According to Kemp, the ingestion of 7·5 per cent of the total heat requirement of the organism in the form of gelatin spares 23 per cent of the body's protein. A total of 2,800 calories is required by a man of 154 pounds weight (Chittenden); 210 calories in gelatin, i.e., about 50 grams of gelatin (or about 1·5 oz.) are necessary. This amount in one quart of water gives a 5 per cent solution, and can be flavoured with lemon, vanilla, etc."

The following is a specimen of a milk free diet employed for typhoid cases by Johnson and Watt:—

6 a.m.: Barley gruel, sugar of milk, 1 dr., and yolk of 1 egg; total, 10 oz.
8 a.m.: Gelatin, 6 oz.
9 a.m.: Lamb broth, 10 oz.
11 a.m.: Gelatin, 6 oz.
12 noon: Rice gruel, sugar of milk, 1 dr., and yolk of 1 egg; total, 10 oz.
2 p.m.: Gelatin, 6 oz.
3 p.m.: Same as at 6 a.m.
5 p.m.: Gelatin, 6 oz.
6 p.m.: Same as at noon.
8 p.m.: Gelatin, 6 oz.
9 p.m.: Pea soup, 10 oz.

With very few exceptions, no feeds were given at night. Besides the food mentioned above, the patients were allowed to have as much water as they liked. After each feeding, ten drops of **Dilute Hydrochloric Acid** were given in the water. Bram advocates **Olive Oil** as well as gelatin. It is certainly very useful in preventing constipation, especially during the early convalescent stage.

PROPHYLAXIS.—The literature relating to **Antityphoid Inoculation** continues to accumulate. Much of it comes from the United States, because typhoid fever is still very prevalent there and opportunities of studying it on a large scale from every point of view are afforded more extensively than in Europe. Some of the most instructive papers are those by F. F. Russell.[20] In one he shows that in the U.S.A. army the incidence of typhoid has been remarkably reduced since the introduction of inoculation. Voluntary vaccination was begun in 1909, but only four soldiers availed themselves of it. During 1910, however, upwards of 16,000 were vaccinated. During 1911 this protective measure was gradually made compulsory, so that by the end of the year it was extended to all persons in the military service under 45 years of age. Before 1910 the annual incidence of typhoid in the whole army, at home and abroad, varied from 6·9 per thousand in 1902 to 3·2 in 1908. It was as high as 5·7 in 1906. In 1910 it was 2·4, in 1911, 0·85, and in 1912, 0·31. In another paper,[21] Russell gives an interesting comparison between the results obtained at San Antonio and along the Mexican frontier during the spring and summer of 1911, and in the records of the Spanish War. "A division of troops, about 20,000 men, was mobilized in Texas and along our southern boundary as far west as San Diego, Cal., in March, 1911; they remained in camp and on march for a period of over four months; then the majority returned to permanent army posts." All these men were vaccinated against typhoid. "The immunization was carried out after the troops arrived at their destination, and while they were under canvas, without interfering with their work. As a result we have to record only two cases of typhoid, one in Texas and one in California, both ending in recovery, in the entire number of troops in the field. In 1898, during the Spanish War, there were assembled at Jacksonville 10,759 troops, among whom there were certainly 1,729 cases of typhoid, and including those probably typhoid, 2,693 cases, with 248 deaths. This camp lasted approximately as long as that at San Antonio; the number of men was less by about 2,000; the troops were situated in about the same latitude, and both were furnished with artesian well water; yet in 1898 there were over 2,000 cases and 248 deaths, and in 1911 there was one mild case. We know that this immunity was not due to lack of exposure, since the fever prevailed to a considerable extent in and around San Antonio." The writer admits that the hygienic and sanitary condition of the recent camps was better than that of those of 1898, but this does not account for the lessened incidence of typhoid.

In both these papers, as well as in a third[22] on antityphoid vaccination in children, Russell advocates the extension of the practice to the civil population. In this view he is supported by Weston,[23] Hachtel and Stoner,[24] and Spooner,[25] who publish accounts of the protective results of protective inoculation in various hospitals and institutions. All these writers agree in stating that antityphoid inoculation, if properly carried out, does not produce any ill effects.

The efficacy of vaccination during the course of an epidemic is discussed by C. J. Hunt[26] in the case of the epidemic which occurred at Troy, Bradford County, Pennsylvania, in October, 1912. In spite of the fact that 4·8 per cent of the vaccinated and 14·2 per cent of the unvaccinated developed the disease, the writer, from epidemiological considerations, writes that "the pertinent conclusions from the studies made in this one epidemic indicate the little value antityphoid vaccine had in limiting the number of cases and in modifying the process in the individual case. . . . The use of vaccine should be limited to those not already infected, that is, to prevent secondary cases."

Castellani[27] has published an account of further experiments in vaccination with living attenuated vaccines. He finds that the use of such vaccine prepared according to his method is harmless. In preparing it, the strain should be non-virulent but rich in antigen, as found out by animal experiments. Such vaccine in the lower animals, and probably in man too, gives rise to a higher degree of immunization than that obtainable with dead vaccines. It must be stated, however, that in man the immunization obtained by two inoculations of this vaccine, or any of the dead vaccines, is never complete; it is only partial. Various mixed vaccines can be prepared, either dead or live attenuated vaccines. Castellani is of the opinion that in countries where paratyphoid A and B are endemic besides typhoid fever, a mixed vaccine of the three organisms should be used.

Leary[28] records two cases of **Removal of the Gall-bladder** in *typhoid carriers*. In one the patient had had gall-stones removed previously, and a chronic and troublesome biliary fistula had resulted. There was no history of typhoid fever in this patient, but he was found to be a carrier, with bacilli in the contents of the gall-bladder, as well as in the fæces. The other case was one in which the patient had become a chronic carrier as a result of an attack of typhoid fever. In both cases the fæces were still free from typhoid bacilli some weeks after the operation.

Those who have not been able to obtain the original German accounts of the antityphoid campaign carried on in certain parts of Germany during recent years, will find an excellent summary, with a description of the organization, in a paper by W. F. Ford,[29] who paid a visit to Saarbrucken for the purpose of studying the methods employed.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1913, ii, 1024; [2]*Ibid.* i, [illegible]; [3]*Bost. Med. and Surg. Jour.* 1913, i, [illegible]; [4]*Rev. de Méd.* 1912, ii, [illegible]; [5]*Brit. Med. Jour.* 1913, i, [illegible]; [6]*Presse Méd.* 1913, [illegible]; [7]*Ibid.* 1912, [illegible]; [8]*Bost. Med. and Surg. Jour.* 1913, ii, [illegible]; [9]*Ibid.* 1913, ii, [illegible]; [10]*Johns Hop. Hosp. Bull.* [illegible], 100; [11]*Presse Méd.* 1913, 145; [12]*Rev. de Méd.* 1913, ii, [illegible]; [13]*Med. Rec.* 1913, ii, [illegible]; [14]*Amer. Jour. Med. Sci.* 1912, ii, [illegible]; [15]*N.Y. Med. Jour.* 1913, ii, [illegible]; [16]*Amer. Jour. Med. Sci.* 1912, ii, [illegible]; [17]*Med. Rec.* 1913, i, [illegible]; [18]*N.Y. Med. Jour.* 1913, i, 228; [19]*Ibid.* 1913, ii, 230; [20]*Jour. Amer. Med. Assoc.* 1913, ii, 666; [21]*Ibid.* 1362; [22]*Ibid.* i, 411 [32]*Ibid.* 1912, ii, 1536; [24]*Ibid.* 1364; [25]*Ibid.*; 1359; [26]*Amer. Jour. Med. Sci.* 1913, i, 826; [27]*Lancet*, 1913, i, 595; [28]*Jour. Amer. Med. Assoc.* 1913, i, 1293; [29]*Johns Hop. Hosp. Bull.* 1912, 260.

TYPHUS FEVER.

E. W. Goodall, M.D.

In a paper in which he discusses the problem of typhus in the United States, J. F. Anderson[1] brings forward evidence which strongly suggests that the disease is much more prevalent in the large American cities than is usually supposed. The discussion arose out of a study of certain cases of so-called "Brill's disease," which is now acknowledged by most authorities to be typhus. At present, however, typhus in the United States has a low case-mortality and shows but little tendency to spread. Often, too, the symptoms are not particularly characteristic. Anderson points out that guinea-pigs are quite susceptible to typhus when inoculated intraperitoneally with blood from victims of the disease during the active febrile period, though the only indication of infection in the animal is the temperature curve, which, in its rise, duration, and fall, is quite typical and readily recognized. He suggests, as a procedure of value in arriving at a correct diagnosis, the inoculation of guinea-pigs intraperitoneally with about 3 c.c. of blood from cases of continued fever giving a negative Widal and blood-culture; especially in cases in which there has been a sudden onset, an atypical eruption, intense headache, apathy, and prostration. For the identity of "Brill's disease" with typhus, a paper by Roger Lee[2] may also be consulted.

REFERENCES.—[1]*Jour Amer. Med. Assoc.* 1913, i, 1845; [2]*Bost. Med. and Surg. Jour.* 1913, i, 122.

ULCERS.

E. Graham Little, M.D., F.R.C.P.

Heidingsfeld and May[1] conducted experiments on the toxicity of **Basic Fuchsin** (Grubler), stated by the latter to consist of a mixture of rosanilin and pararosanilin hydrochloride. Satisfied of its comparative non-toxicity, they treated twenty cases of chronic ulcer with an ointment consisting of :—

℞	Fuchsin (Grubler's "fuchsin für bakterien")	5 parts	Eucalyptus Oil	10 parts
			Anhyd. Wool Fat	100 parts

The ointment was applied daily on lint.

Within six weeks ten of the cases had made excellent progress. When dermatitis results from this ointment, a weaker formula may be substituted, e.g. :—

℞	Fuchsin	1 part	Anhyd. Wool Fat	100 parts
	Petrolatum	5 parts		

The substitution of commercial fuchsin for the Grubler preparation was not attended with success. Merck's *fuchsine medicinal* seems to possess the same properties.

Greene[2] reports the cure within three weeks of a varicose ulcer, two by three inches in extent, by the application thrice daily of a mass of well ripened full **Cream Cheese**, mixed with cream and water, spread on gauze. The cheese would disappear in five or six hours. The patient could take no rest, and was engaged throughout the treatment in active farm and dairy work.

References.—[1]*Jour. Amer. Med. Assoc.* 1913, i, 1080; [2]*Med. Rec.* 1913, ii, 381.

UMBILICAL INFECTIONS IN THE NEWBORN.

Frederick Langmead, M.D., F.R.C.P.

It is generally recognized that the umbilicus is the portal for a majority of the infections in the first few days or weeks of life. Among the results of umbilical infection at this age, lesions of the lung are some of the most important; indeed, a rapidly fatal septicæmia may manifest itself clinically by signs of pulmonary disease alone. M. E. Bonnaire and M. G. Durante[1] have recently described in detail the pulmonary complications which umbilical infection may produce. They divide the lesions into three classes: purplish ill-defined areas of congestion arising as the result of toxæmia alone, and therefore free from micro-organisms; miliary infarcts with or without surrounding zones of inflammatory reaction, sometimes coalescing to form nodules of hepatization, which nearly resemble broncho-pneumonic areas, but differ from them in the absence of bronchitis and the presence of organisms in the vessels; and, lastly, cicatrices found in the lungs of babies who survive the lung affection, but succumb afterwards to some other disease. The form of the lesions varies according to the mode of invasion of the infection. Thus there may be a local cellulitis with general toxæmia, a gradual infection of the blood-stream, or embolism with pyæmia.

Diagnosis of these conditions is difficult, as the signs are very indefinite, the only distinctive one being the presence of small areas of dullness, to elicit which very light percussion is necessary. In some cases the local condition does not suggest to the observer that the navel is the source of infection.

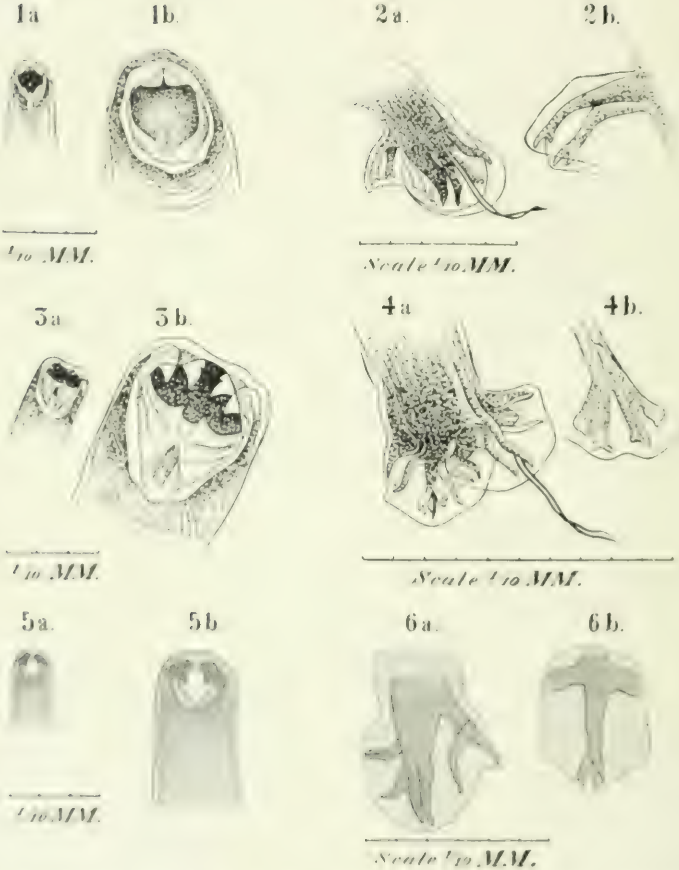
Prognosis depends upon the nature of the infecting micro-organism. With saprophytes only the outlook is favourable; streptococcal infection is almost always followed by a fatal septicæmia, whilst staphylococcal infections occupy an intermediate position in point of gravity, chiefly because they usually remain localized to the navel. In premature infants these infections are very fatal. Many of the infants who recover remain in a state of feebleness, or are permanently damaged to a greater or less degree.

These writers give statistics which show the importance of the pulmonary complications of umbilical infection. In 2603 infants umbilical infection occurred 431 times. Post-mortem observations revealed lesions in the lungs in 20 per cent of the cases examined. During life, however, only 3 per cent gave signs of lung disease, an indication of the difficulty of detecting this affection clinically.

Reference.—[1]*Presse Méd.* 1913, 410.

PLATE LXIII

UNCINARIASIS



1a — The buccal capsule of Necator americanus 1b - The same magnified
2a — Copulatory bursa of Necator americanus 2b - Branches of dorsal ray magnified
3a — The buccal capsule of Ankylostoma duodenale 3b - The same magnified
4a — Copulatory bursa of Ankylostoma duodenale 4b - The dorsal ray magnified
5a — buccal capsule of Agchylostoma ceylanicum 5b - The same magnified
6a — Copulatory bursa of Agchylostoma ceylanicum 6b - Dorsal ray magnified

UNCINARIASIS.

Leonard Rogers, M.D., F.R.C.P.

E. R. Stitt[1] describes and illustrates a quick way of differentiating the species of hookworm met with in man. In order to get the right views of the worms fresh ones are placed in salt solution under a cover-glass and rolled on their long axis by manipulating the cover-glass with a toothpick, and examined with a ⅔-in. objective. By getting a direct view into the buccal cavity, the four hook-like ventral teeth of the *Ankylostoma duodenale* contrast with the smaller opening, semilunar lips, and prominent dorsal median tooth of the *Necator americanus*. Next the copulatory bursa of the male is examined, and the deep cleft and bipartite tips of the two branches of the dorsal ray of the *necator* distinguish it from the shallow cleft and tridigitate tips of the *ankylostomum*. In the female the vulva is at or near the posterior third in the *ankylostomum*, but near the equator, but in the anterior half, in the American species. For preserving specimens for subsequent examination, he recommends Braun's and Luhe's solution, consisting of lactic acid, glycerin two parts, and lactic acid, crystallized phenol, and water, each one part, after fixing in 2 per cent formaldehyde for two hours. For permanently mounting, ring the cover-glass with gold size. (*Plate LXIII.*)

Clayton Lane[2] records the occurrence of *Agchylostoma ceylanicum* in a man in India, this worm having previously first been described by Looss in material from a civet cat from Colombo. Lane has now found it commonly in dogs and cats in Bengal, as Looss suggested probable, and during the examination of prisoners in the Berhampore gaol the new form was found in three of them. It is smaller than *A. duodenale*; the head end is largely transparent when fresh. Of the two pairs of ventral marginal teeth, one pair is deep and cephalad, and the other are superficial and caudal. The bursa of the male has marked clefts dividing the dorsal from the lateral lobes; the dorsal ray bifurcates, and each branch again bifurcates, while the edge of the dorsal lobe of the bursa has a single convex curve on each side of the middle line, the two curves producing an outline like that of a weak figure 3. The lateral lobe is rather long and rounded. If this worm proves to be common in man, the fact that domestic animals harbour the parasite will introduce an important factor in the prophylaxis against infection.

B. K. Ashford[3] gives a graphic description of the important economical aspects of the widespread occurrence of severe degrees of anæmia caused by hookworm disease in Porto Rico, where he was the first to draw attention to the true nature of the scourge. He has been closely identified with a gigantic and wonderfully successful campaign since waged against the evil, which was sapping the strength of the labourers and reducing their working capacity to a fraction of its normal level. Since 1904, 300,000 persons have been successfully treated by the Commission alone, and very large additional numbers through other agencies. Formerly, the deaths from anæmia alone amounted to 15 per cent of the total, while the average hæmoglobin was only between

50 and 60 per cent. The mortality from anæmia has now fallen to only one-eighth of what it used to be, and only remains of any importance in far-away mountainous areas. These good results are testified to by the replies of 224 planters living in all parts of the island.

R. Saundby[4] describes the occurrence of ankylostoma in very small numbers, not more than three ever having been found in a stool after treatment with thymol, etc. He attributed serious nervous symptoms with fits of unconsciousness to the infection; but in view of the fact that 60 to 80 per cent of healthy people in India harbour such small numbers of ankylostoma it is extremely doubtful if they were of etiological importance in Saundby's patient.

E. J. Wyler[5] deals with this disease in the Udi district of Southern Nigeria. No less than 169 out of 200 people examined harboured the hookworm, both varieties being met with. The ova were easily found, indicating a heavy infection, while other worms were present in addition in 50 per cent of the cases. **Thymol** in quantities of 60 gr. proved harmless and effective. Anæmia of a moderate degree was found in 79 per cent of the subjects.

REFERENCES.—[1]*Journ. Amer. Med. Assoc.* 1912, i; [2]*Ind. Med. Gaz.* 1913, 217; [3]*Amer. Jour. Med. Sci.* 1913, i. 168; [4]*Lancet*, 1913, i. 1224; [5]*Jour. Trop. Med. and Hyg.* 1913, 103.

URETERAL OBSTRUCTION. *J. W. Thomson Walker, M.B., F.R.C.S.*

H. D. Furniss[1] finds that *stricture of the ureter* is more frequent than is generally supposed. The diagnosis, especially on the right side, is frequently mistaken. The most common causes are inflammatory, and the infection may be descending or ascending. The most certain method of diagnosis is *pyelography*.

Walter S. Reynolds[2] reports a case of *ureteral calculus* treated by **Oil Injections** into the ureter. A number of these injections were made, and the stone was eventually passed. A case of calculi in the pelvic portion of the ureter operated on by the transperitoneal route is recorded by George Wherry.[3] This plan was chosen as the calculi were situated so deeply in the pelvis that a large wound would have been required for an extraperitoneal operation, with subsequent drainage, and there would have been difficulty in suturing the wound in the ureter.

F. Kidd[4] describes a small *muscle-splitting incision* for the exposure of the pelvic portion of the ureter. An incision 3 in. long is made through the skin 1½ in. above Poupart's ligament, and extending from the edge of the rectus muscle 2 in. outwards and 1 in. inwards. The centre of the incision lies vertically above the internal abdominal ring. The external oblique aponeurosis is split in the direction of its fibres 1 in. inwards in front of the rectus muscle and 2 in. outwards from it. The internal oblique and transversalis muscles are split in the direction of their fibres for 2 in. outwards from the outer edge of the rectus muscle and 1 in. inwards through its anterior sheath. The rectus muscle is separated from its posterior sheath and retracted inwards. The transversalis fascia is torn through external to and above the deep epigastric vessels, and the peritoneum pushed upwards. The rest of the operation follows conventional lines.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1912, ii, 2051; [2]*Med. Rec.* 1912, ii. 1078; [3]*Brit. Med. Jour.* 1913, i. 1348; [4]*Lancet*, 1913, i. 1578.

URETHRAL DISEASES. *J. W. Thomson Walker, M.B., F.R.C.S.*

J. L. Herman[1] records a case of so-called *double urethra* occurring in a Jamaican negro of twenty-four years. The accessory canal arose from the point of the glans penis just above the normal meatus, the two being separated by a very thin plate of tissue. It extended backwards to the mid-point of the root of the penis, traversing the body of the organ diagonally and becoming more superficial posteriorly. A gonorrhœal infection of the urethra and accessory canal persisted in the latter, and resisted treatment until the posterior end of the canal was opened at the base of the penis under local anæsthesia and the canal thoroughly irrigated.

An operation for *penile hypospadias* in three stages is described by Arthur Edmunds.[2] Stage I.: A transverse button-hole incision is made through the whole thickness of the prepuce, and the edges stitched round like a button-hole. The object is to divide the dorsal vessels of the prepuce and lead to the formation of a number of smaller lateral vessels. Stage II.: Three months later an incision is made through the prepuce from the middle of the button-hole to the free border, so as to form two flaps. An incision is now made along each side of the urethral groove, and these are joined in front by an incision in the glans around the point where the meatus would normally be situated. The urethral groove is dissected up completely from before backwards, and the penis can now be straightened. An incision is made on each side from the anterior end of the raw area thus produced, and carried around the corona glandis until the middle of the preputial flap is reached, when the direction of the incision is changed to the long axis of the flap to its end. The lax tissues are now opened out, the skin made to cover the whole of the raw area, and stitches are introduced. Stage III.: Three months later a soft rubber catheter is passed along the under surface of the penis and into the urethra which opens at its base, and is stitched in place. An incision is made on each side of this, and flaps are raised and sutured over the catheter. The skin is raised on either side and drawn together over this. Fistulæ are most likely to form at the base of the glans or just in front of the scrotum, and are closed by turning a flap of skin over from the side and covering this by a second flap. The operation can be performed at any time after the age of three, but it is easier when the child is older.

Urethral Defects.—According to Müller,[3] the method of **Thiersch Grafting** has not yet been seriously employed. The urethra possesses a remarkable power of regeneration, and in small defects repair takes place by natural means. In larger defects the most simple method is to take advantage of the elasticity of the urethra and to mobilize the cut ends. When the urine is aseptic, careful suturing holds. In this way defects as great as 6 cm. (Goldmann) and 9 cm. (Sick) have been repaired. Sometimes, owing to extensive scarring, there is great difficulty in mobilizing the urethra. In such cases, hollow tubes, such as portions of a vein, have been transplanted. There is, however, no certainty that the lumen will be maintained. The author relates five cases in which Thiersch grafts were successfully used. The grafts are applied at once after resection of the stricture or operation for hypospadias, and when the whole of the wound right up to the outer skin is covered with a layer of epithelium, a plastic operation is carried out by turning flaps over a catheter.

Fistulæ.—Urinary fistulæ after perineal prostatectomy are, according to Lothrop,[4] not uncommon. In some cases careful operators are able to remove the gland without material injury to the urethra, but, as a rule, it is considerably torn. With a view to preventing such fistulæ, the author recommends that care should be taken to avoid injury, a catheter introduced along the whole urethra, and a light gauze packing left in the wound. In many cases the wound may be nearly closed with large silkworm-gut sutures. If there is no contra-indication the catheter should remain in the urethra for at least one week. For fistula following external urethrotomy for stricture, the author recommends dissection of the track, suturing of the communication with the urethra, and tying a catheter in the urethra.

Stricture.—J. R. Eastman[5] describes a method of **Continuous Dilatation** of extensive urethral stricture. When a catheter is placed in the urethra there are two situations at which it becomes bent: at the membranous urethra, and at the penoscrotal junction. Severe inflammation and abscess formation have been known to follow. To avoid these disadvantages, the author introduces one catheter through the prostatic urethra into the bladder through a perineal incision, and places a second in the anterior urethra reaching down to the first. This serves to produce continuous dilatation of the stricture. Large soft rubber catheters are used.

A method by which the Wheelhouse operation is rendered easier in cases of impassable stricture of the urethra is described by A. B. Cecil.[6] A solution of methylene blue, when injected into the urethra, will permeate and stain the canal in such a manner that it can be followed throughout its entire course. The solution used is 1 gram of methylene blue to 200 c.c. of distilled water. The injection is made with moderate pressure at first, and then with more force. The stain is allowed to remain in for five minutes, and the canal is then washed with sterile water. A sound is passed down to the stricture, the end cut down upon, and the urethra retracted. The further course of the canal is indicated by the blue stain; a grooved director is then passed along it and the incision carried backwards. The method may also be used for dissecting out perineal fistulæ.

In an article on impermeable stricture of the bulbomembranous urethra, John B. Deaver[7] considers five methods of operative treatment. Perineal section he considers "blind and time-consuming." Incision of the urethra anterior to the stricture, the passage of a probe or filiform bougie through the stricture, and incision of the stricture on this, is the most commonly used method and is usually easy. The disadvantage is that, when it fails, a perineal dissection must be commenced. Cock's operation (incising the urethra at the apex of the prostate) left the stricture untouched. The method advised by Young is also advocated by Deaver. The apex of the prostate is exposed as if to commence perineal prostatectomy. The urethra is incised through the tissue at the apex of the prostate, a sound passed forward to the posterior face of the stricture, and the stricture cut. He does not favour the method of suprapubic cystotomy, retrograde catheterization, urethrotomy behind the stricture, and incision of the stricture.

C. G. Cumston[8] states that in regard to utility of **Resection** opinion is unanimous, but the same cannot be said in regard to reconstruction of the urethra. Once the resection is done, the choice is offered between secondary union, immediate end-to-end suture, simple urethrostomy, and urethrorrhaphy with deviation of the urine. Secondary union without sutures, with a permanent catheter in the bladder, has given unsatisfactory results. The immediate effects of end-to-end suture may be good, but the ultimate results are not always favourable, for secondary infiltration may occur round a suture and lead to the development of scar tissue. Both these methods necessitate a permanent catheter during convalescence, and this prevents primary union. Urethrostomy is "a temporary gun-barrel suturing of the two ends of the urethra to the perineum after rupture or operation wound of the canal." Another indication for this procedure is wide separation of the cut ends after extensive resection of the canal. Urethrostomy necessitates interference two or three months later, in order to close the perineal meatus and reconstruct the canal.

The operation performed by this author is **Urethrorrhaphy** with deviation of the urine. An incision is made in the middle line of the perineum over the stricture. All the scar tissue is removed with scissors, and a clean-cut anterior and posterior end to the canal obtained. As much as 6 cm. of the canal can be removed without danger. The posterior part of the urethra is dissected out from 1 to 2 cm. and the anterior is freed from 3 to 5 cm. The ends must come in contact without tension. The anterior end of the urethra is brought down and fixed by catgut sutures to the periurethral tissues on each side. When these are tied, the anterior and posterior ends can be approximated without tension. Two fine catgut sutures are placed in the anterior portion of the urethra without including the mucosa, and similarly carried through the posterior end. A large sound is passed into the bladder and the two sutures are tied. The remaining sutures are now inserted with the sound in place, and all the knots are tied outside the canal. An opening is now made in the bulbous urethra at least 1·5 cm. behind the line of suture, and a catheter passed through this into the bladder after withdrawing the sound. The catheter is fixed with silkworm-gut sutures passed through the edges of the cutaneous incision. The soft structures are approximated, leaving space for drainage alongside the catheter, which is removed on the tenth day, the fistula closing in a week.

REFERENCES.—[1]*N. Y. Med. Jour.* 1913, i, 1019; [2]*Lancet*, 1913, i, 447; [3]*Deut. med. Woch.* 1912, 2407; [4]*Bost. Med. and Surg. Jour.* 1913, i, 188; [5]*Jour. Amer. Med. Assoc.* 1912, ii, 2064; [6]*Ibid.* 1913, i, 1066; [7]*Ibid.* 202; [8]*Ann. Surg.* 1913, i, 350.

URINARY INCONTINENCE IN WOMEN. (*See also* UTERUS, DISPLACEMENTS, OF.)

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

Howard Kelly[1] describes an operation which he has found invariably successful in cases of incontinence of urine in women in which, from previous injury, generally the result of labour with application of forceps, there has been bruising of the muscles in the region of the neck of the bladder or of the sphincter urethræ, with consequent inefficiency in control. The symptoms may be those of a true incontinence, or of an intermittent character, such as is evidenced after a certain degree of fullness, or a jet of urine upon some unusual increase in intra-abdominal tension, e.g., coughing or stepping on to a tramcar. Many of these patients have previously seen a specialist, who performed a colpoperineorrhaphy, or perhaps tried bringing the tissues together over the urethra from below in the vagina, or kinking the urethra upon itself. Kelly's method is to cut down upon a mushroom catheter which engages in the neck of the bladder, so as to define its muscles; then with mattress sutures he laces the relaxed or torn muscles together beneath the catheter.

Chenhall[2] reports a case of cure of frequency of micturition in an elderly woman by ventrofixation of the uterus. The uterus was found acutely anteflexed and resting on the bladder.

REFERENCES.—[1]*Therap. Gaz.* 1912, 854; [2]*Austral. Med. Gaz.* 1913, 121.

URINARY INFECTIONS. (*See also* PYELITIS). *Francis D. Boyd, M.D.*

Jordan,[1] in a report on *urinary antiseptics*, finds that the acidity of the urine is readily increased to an extent of more than double the normal by the administration of **Acid Sodium Phosphate**, and to a considerably less extent by **Benzoates**; with large doses of **Citrate** it is readily rendered alkaline. Urinary putrefaction and the growth of *staphylococcus* is aided by alkalinity and delayed by acidity in proportion to the amount thereof. The reverse is the case with *B. coli*, but only to a small extent, for its growth is luxuriant in both acid and alkaline urines. **Hexamethylenetetramine** (urotropin) is not itself antiseptic, but only acts after the liberation of formaldehyde in the urine. This only takes place in acid urine, for the substance is inert in an alkaline medium. The degree of antiseptic power is in proportion to the acidity, and it is the most efficient urinary antiseptic when the acidity of the urine is normal or supernormal. There appears no evidence that helmitol acts differently from hexamethylenetetramine when excreted in the urine. **Sandalwood Oil** is a poor general antiseptic, but appears to have a specific action on the staphylococcus which may apply to cocci generally. It is of some use in alkaline urine. **Boric Acid** is an efficient antiseptic; its action is unaffected by alkalinity, so it is the most efficient substance we possess when the urine is alkaline. **Uva Ursi** is a good antiseptic; its action is certainly not due chiefly to the arbutin it contains.

The legitimate practical deductions appear to be that **Urotropin,** together with acid sodium phosphate, may be used as a prophylactic before any operation or procedure where the urine may become infected, and is of the utmost value, since, if the urine is highly acid and sufficient urotropin given in small doses to keep it constantly charged with formaldehyde, it becomes a powerful antiseptic fluid in which organisms cannot live. Urotropin should only be used when the urine is or can be made acid; otherwise it is inert. It should never be given with potassium citrate in *B. coli* infection. If it be desired to try the effect of making the urine alkaline in these conditions, boric acid or the uva ursi infusion should be employed as antiseptics, along with citrates. Where the urine is undergoing *ammoniacal fermentation* in the bladder, bladder washes or other operative procedure will always be a most important part of the treatment. The best medicinal substances to use are **Boric Acid** in large doses, **Uva Ursi,** and possibly **Sandalwood Oil.** Sandalwood oil is always worth trying in cystitis due to the staphylococcus alone. When acid sodium phosphate is prescribed, it is as well to write the chemical formula NaH_2PO_4 on the prescription, and to ascertain that the right phosphate is being dispensed. It is worth while, in giving these substances, to estimate the acidity of the urine occasionally, to make sure that there is an increase. Unless the acidity is kept high, urotropin will not act efficiently, and a high acidity is of much more value than large doses of urotropin.

In a discussion on urinary antiseptics, Thomson Walker[2] strongly urged that the urine should be examined for the presence of formaldehyde. Without a systematic examination of the urine, the physician is in the dark as to whether formaldehyde is being liberated or not. The tests advised are as follows: (1) *Phloroglucin test.* - The following solutions are used: (*a*) Aqueous solution of phloroglucin (1 per cent); (*b*) Solution of caustic soda (30 per cent). A few drops of phloroglucin solution are added to the urine in a test tube, and then 5 drops of the caustic soda solution. A bright cherry-red colour appears if formaldehyde is present, but no colour if there is only urotropin in the urine. This test will show the presence of formaldehyde in a dilution of 1–50,000 in the urine. (2) *Burnam's Modification of Rimini's Test.*—The following three solutions are used (*a*) Phenyl-hydrazine hydrochloride, 0·5 per cent; (*b*) Sodium nitro-prusside, 5 per cent;

(c) Sodium hydrate, saturated solution. Three drops of each of the first two solutions are added to the urine, and a few drops of the sodium hydrate solution poured along the side of the test-tube. If formaldehyde is present, a deep greenish-black colour passes down through the urine and clouds it. This rapidly changes to green, and fades through bright green to orange and pale yellow. The urine and the sodium hydrate solution should be warmed to slightly above body temperature. This test will detect formaldehyde in urine in a dilution of 1 : 150,000, but does not show the reaction with urotropin. According to Burnam, there is an intense dark blue colour, changing to green in solutions of 1 : 20,000 or stronger, and in solutions of less strength the first colour is an intense green. If these tests for formaldehyde are negative, a fresh sample of urine should be boiled, after the addition of a few drops of sulphuric acid. The test is then applied, and if the formaldehyde reaction is now present, the urine has contained urotropin.

REFERENCES.—[1]*Brit. Med. Jour.* 1913, ii, 648; [2]*Ibid.* 654.

URINE TESTS. (See also PROTEINURIA; RENAL EFFICIENCY; URINARY INFECTIONS.)

O. C. Gruner, M.D.

Glucose.—Cole[1] discusses the fact that small amounts of glucose in the urine occur much more frequently in health than is usually believed, and shows that the limits of tolerance to a carbohydrate diet in various pathological conditions might be usefully studied. He finds that the fallacies existing with the Fehling test could be overcome by the use of blood charcoal to take up the urates and creatinin, while the addition of 10 per cent acetic acid or 15 per cent acetone would prevent the absorption of glucose by the charcoal. This method is employed largely for the purpose of distinguishing between lactose and glucose.

Acetone.—The various tests for acetone, and their chemistry, are given by Hurtley.[2] His special test is performed as follows: To 10 c.c. of the urine add 2·5 c.c. of concentrated hydrochloric acid and 1 c.c. of a 1 per cent solution of sodium nitrite. Shake and allow to stand two minutes. Now add 15 c.c. of strong ammonia, followed by 5 c.c. of a 10 per cent solution of ferrous sulphate or a solution of ferrous chloride of equivalent strength (2 grams of iron in 100 c.c.). Shake up, pour into a 50 c.c. Nessler glass, and allow to stand undisturbed. It is not advisable to filter. A beautiful violet or purple colour is produced. The reaction is a slow one, and the speed at which the colour develops depends on the concentration of the aceto-acetic acid in the urine; the colour deepens for several hours after its first appearance. The explanation offered is that the aceto-acetic acid is converted by the nitrous acid into isonitrosoacetone, which forms a salt with the ammonia; the ferrous salt then produces a purple-coloured salt from the ammonia salt by double decomposition.

$$\underset{\text{Acetoacetic acid}}{CH_3COCH_2COOH} \rightarrow \underset{\text{Isonitrosoacetone}}{CH_3COCH.NOH} \rightarrow \underset{\text{Ferrous salt}}{(CH_3COCHNO)_2Fe}$$

It is delicate enough to detect acetone 1-50,000. A modification enabling a quantitive analysis to be made is also given.

Bonnamour and Imbert[3] have modified Legal's test. The reagent consists of 10 grams of glacial acetic acid and 10 c.c. of 1-10 solution of sodium nitro-prusside; 20 drops of this are added to 15 c.c. of urine, and then 20 drops of ammonia are allowed to float on as for a ring test. A violet disc appears if 1-2000 part of acetone is present. Just as "acetone bodies" in the urine are usually included with the acetone, the same tests will be found to be employed for both. Thus, these authors modified Gerhardt's test as follows: dilute the urine four times, and add a 10 per cent solution of ferric chroride drop by drop. If acetone alone is present, a white cloudy precipitate forms, whereas diacetic acid produces a black-violet cloud.

The fact that ordinary tests for acetone in the urine are usually concerned really with the presence of acetone bodies in it, is brought out by Piper,[4] who studied their appearance in the urine after operations and certain diseases. He found that acetone is apt to appear after operations in those persons endowed with a neurotic temperament.

Total Nitrogen and Ammonia-nitrogen.—Simplified methods for estimations of these have been given by Rosenbloom.[5] For *total nitrogen*, mix 2 c.c. of urine with 5 c.c. of concentrated sulphuric acid and 5 drops of a 1 per cent solution of platinum chloride, and heat in a Kjeldahl flask till the mixture is clear. Transfer to a 350 c.c. Erlenmeyer flask, add about 100 c.c. water, 6 drops of neutral litmus solution (Kubel-Tiemann), and 10 c.c. of a 30 per cent solution of sodium hydroxide. Cool the flask in running water, and when it is quite cold, gradually add more of the 30 per cent sodium hydroxide, until the fluid is blue, taking care to keep it as cool as possible all the time. Make the solution slightly acid with fifth-normal acid, and then neutralize with fifth-normal sodium hydroxide. Add to this neutral solution 15 c.c. of neutral formaldehyde, and 1 c.c. of 1 per cent alcoholic solution of phenolphthalein. Titrate this with fifth-normal sodium hydroxide until a violet colour appears. The number of c.c. of sodium hydroxide solution, 0·0028, gives the amount of nitrogen present in the 2 c.c. of urine. For *ammonia nitrogen*, 10 c.c. of urine are diluted with about 50 c.c. of water; three drops of a 1 per cent alcoholic solution of phenolphthalein and about 5 grams of powdered neutral potassium oxalate are added. Decinormal sodium hydroxide solution is added from a burette, and the reading taken when a permanent faint pink colour appears. Five c.c. of a neutral solution of formaldehyde are then added, and it will be found that the pink colour will disappear. The addition of decinormal soda is continued till the pink colour of the mixture is just restored, and the reading is taken again. The difference between the first and second readings gives the amount of acid that was combined with ammonia, and this × ·0014 gives the quantity of ammonia-nitrogen in 10 c.c. of urine.

Oxy-protein-acid-nitrogen.—The variations of this form of nitrogen are given by Erben.[6] Roughly it amounts to about 1 per cent of the non-precipitable nitrogen. It does not run parallel with the amino-acid secretion. Oxy-protein acids precipitated from acid solution by mercury acetate are increased in certain diseases of the liver, in some infectious diseases and pernicious anæmia, as well as in cancer.

Albumin.—Discussing the relation between albumin content and the amount of pus in the urine, Warren[7] says that the most marked cases of cystitis show no more than ·15 per cent of albumin. If the urine be free of blood and there is more than this percentage of albumin, one may be sure that the pus comes from the kidney. If there be a very little pus and yet the albumin content is ·15 per cent, it is very likely that the kidney is involved.

Organized Sediments.—The need for noticing the existence of any kind of cast in the urine is strongly brought out by Thornton.[8] He considers that even hyaline casts should be looked upon as indications of senility, regardless of the patient's age in years. The real difference between granular, hyaline, and fatty casts remains unknown. He cites a case in which the finding of casts with crystals of calcium oxalate in the deposit proved the incorrectness of a diagnosis of appendicitis, and directed attention to the existence of a stone in the kidney.

He[9] gives the following *stain for urinary sediments*: Twenty c.c. of ·2 per cent crystal violet and 5 c.c. of glacial acetic acid are added to 75 c.c. water, and the deposit is mixed with an equal volume of stain. Hyaline casts come out a pale violet, bacteria and nuclei a deep violet, and other casts darker lilac.

Bacteriuria is discussed by Hale White.[10] He refers to the advantage of isolating the organisms in question for the purpose of treating the patients with autogenous vaccines.

Pigments.—Fischer[11] gives a spectroscopic test for hemibilirubin. The test is rather elaborate, and requires a large quantity of urine in order to obtain enough pigment. Flatow and Brunell[12] give a test for urobilinogen-red. Here again a colorimeter is necessary, and it is hardly possible to carry out this test except in a specially equipped laboratory.

Ferments.—Corbett[13] has elaborated a method of estimating the amylolytic ferment in urine, thus: A series of test-tubes receives successively diminishing quantities of urine with 2 c.c. of ·1 per cent solution of soluble starch. After warming on a water-bath at 40° for half an hour, a drop of one-fiftieth normal iodine is added, and the tube in which a mauve tint just appears is noted. The result is calculated in terms of the number of c.c. of starch solution digested by 1 c.c. urine in half an hour. The normal lies between ten and thirty. It is below normal in diabetes, and very high in chronic pancreatitis and eclampsia. An increased ratio between the urine contents of the ferment to that in the blood means less of renal efficiency.

REFERENCES.—[1]*Lancet*, 1913, ii, 840; [2]*Ibid.* i, 1160; [3]*Presse Méd.* 1913, 130; [4]*Lancet*, 1913, ii, 1382; [5]*Jour. Amer. Med. Assoc.* 1913, ii, 857; [6]*Prager med. Woch.* 1913, No. 1; [7]*N.Y. Med. Jour.* 1912, ii, 1228; [8]*Lancet*, 1913, i, 1561; [9]*Zeits. f. Urol.* 1913, No. 26; [10]*Lancet*, 1912, ii, 1204; [11]*Münch. med. Woch.* 1913, 2311; [12]*Ibid.* 2314; [13]*Quart. Jour. Med.* 1913, Apr. 351.

URTICARIA.

E. Graham Little, M.D., F.R.C.P.

Swann[1] has found immediate benefit in urticaria by giving subcutaneous injections of **Adrenalin Chloride** (1–1000) in doses of 8 min. for every ten stone of the patient's weight, this dose being repeated ten minutes later. Two doses usually sufficed to control an individual attack; but the eruption tends to reappear from two to three hours after the injection. The author suggests trial of the medication in acute cases of angioneurotic œdema which, when it affects the air-passages, may threaten life itself.

The development of urticaria in young children changing from the country to the town is noted by Letchfield,[2] who ascribes it as probably due to change in water supply.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* 1913, i, 373; [2]*Austral. Med. Gaz.* 1913, 391.

UTERUS, DISEASES OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

Cancer.—Lenormant[1] describes in detail the results of *cystoscopic examination* of cases of carcinoma of the cervix under the following headings: bulgings of the bladder wall, displacement of the trigone, puckerings of vesical mucous membrane, œdema of the mucosa, actual invasion of the mucous membrane by growth. These conditions are met with in other diseases, are of no value in the diagnosis, but are helpful in showing the operability of the case. He considers that puckerings of the mucous membrane are caused by tight adhesions, and injury to the bladder wall during operation is likely to be done. Puckerings and œdema of the mucous membrane are usually due to adhesions of the growth itself, and therefore make the operation dangerous, if not useless. He also found that compression of the ureters is common, but that actual invasion by growth is rare.

Howard Kelly and Craig Neel,[2] from a study of cases treated at the Johns Hopkins Hospital, find that **Extensive Abdominal Removal** of all cervical carcinomata is justified where there is any hope of complete excision, unless there is some special contraindication to surgical treatment. The operation, if properly performed, notwithstanding the high primary mortality, has given the greatest percentage of permanent cures of any therapeutic measure thus far suggested. By improvement in technique the primary mortality has been decreased from 28·5 to 11·5 per cent. An exploratory laparotomy is often necessary to determine if a case is operable. Decreased mobility of the cervix is sometimes due to a secondary inflammatory reaction, and may be improved by a thorough cauterization of the growth. Preliminary cauterization and disinfection of the primary growth are advisable in all cases. Preliminary catheterization of the ureters is a valuable aid, especially in fat patients, and does not necessarily increase the probability of fistulæ and secondary infection of the urinary tract. Extensive glandular dissection is not justified, since the increase in permanent cures does not compensate for the rise in the primary mortality. They consider **Radium**, used in large quantities (100 to 200 mgrams at a time), to be of great value in cases which are in an inoperable condition, and in early recurrence after operation. It may be used with a view to effecting a cure of the disease in inoperable cases; before operation with a view to rendering innocuous any small area of disseminated cancer cells which might not have been extirpated, and would rapidly cause recurrence; or at the end of operation, to destroy any cancerous cells left at the base of the broad ligament, or in cases in which the operation has been deliberately conducted through diseased tissues, relying on radium to destroy them. It may also be applied after operation in cases of early recurrence in the vaginal vault, or in the remains of the broad ligaments.

Faure[2] states his conclusions drawn from a series of 250 operations for cancer of the uterus since [illegible]. In early cancer which only involves one lip of the cervix, leaving the mobility of uterus unimpaired, the operative mortality does not exceed 5 per cent. He has cures of eight, ten and fourteen years' duration. When both lips, the vaginal mucosa, and the base of the broad ligaments are attacked, with diminished mobility of the uterus, the operative mortality is about 20 per cent; and in only 30 per cent is there a permanent cure. When the uterus is almost fixed and invasion of the broad ligaments extensive, the operative mortality is 50 per cent, and recurrence is the rule. The operative mortality of his whole series was 15 per cent, with 33 to 40 per cent permanent cures. He prefers Wertheim's abdominal to Schauta's vaginal operation, limiting the latter to very cachectic or obese cases; Wertheim's operation is more easily performed in pregnant patients. He thinks that radium should not be used before operation, owing to its sclerosing action on tissues, but finds its application three weeks after operation very useful.

Childe,[3] in a paper on a new method of performing Wertheim's panhysterectomy, says that metal retractors should be avoided, as they injure the edges of the wound; the only retractor should be a gloved finger. The vagina and cervix are cleansed at the beginning of the operation after the patient is anæsthetized; all growth is cut or scraped away, the raw surface is cauterized by a Paquelin cautery, then carefully dried and painted with a 2 per cent solution of iodine in spirit, and the vagina tightly packed with dry sterile gauze, which is removed when the vagina is about to be divided. Perfect hæmostasis is essential; this he secures by cauterizing the parametric tissue and the cut vaginal surfaces with a Paquelin cautery.

Sampson[4] reports the results of the radical abdominal operation for cancer of the cervix in 25 cases. Only 8 had been operated upon five years or more ago; of these, 2 died from the operation and 2 from recurrence within five years, while 4 are still alive and—so far as clinical examination can make out—are quite free from cancer. Cullen[5] discusses the technique and results of the same operation in a large number of cases. He considers that Wertheim's operation is the most satisfactory, and that surgeons should operate when there is the slightest chance of cure, in view of the terrible death which occurs in patients not operated upon. He also makes a plea for the education of women in America with regard to the dangers of allowing vaginal hæmorrhage at or about the time of the menopause to be neglected.

Werder,[7] describing the treatment of cancer of the cervix uteri by the **Cautery**, says that he prefers the galvano-cautery to the Paquelin. His first nineteen cases were done by the vaginal route only, but since then he has used a combined vaginal and abdominal method. He begins with a thorough curetting of the diseased surfaces, which he next cauterizes to stop bleeding. The cervix is then pulled down, and an incision made around it as far as possible from the growth, with the cautery knife, kept at a dull red heat. The uterus and bladder are carefully separated until the peritoneum is reached but not opened. Douglas' pouch is next opened and the lateral vaginal attachments burned through. The vagina is then tightly packed with gauze. The abdomen is now opened by a suprapubic incision and the utero-vesical peritoneum incised. The infundibulo-pelvic ligaments are divided by Downes' electro-thermic clamp. The parametrium and broad ligaments on each side are divided with the cautery, the ureter and bladder being carefully protected; occasionally the uterine arteries have to be ligatured. The cut vaginal surface is then carefully cauterized before closing the abdomen. He seldom removes lymphatic glands. He has treated 78 cases by this method; his operative mortality has been 5 per cent. In 39 cases five years or more have elapsed since operation, 18 of whom have survived; but 4 of these have since died of recurrence between five and six-and-a-half years after operation, so that 14 only are still living. He considers that accidents to bladder, ureters, and intestine are no commoner by this method than by any other.

Amputation of the Cervix.—Leonard,[8] in a paper on the after-results of this operation in 128 cases, says that hæmorrhage after amputation occurs in 5 per cent of cases; it may be weeks after, and is then due to infection rather than faulty suture. Persistent leucorrhœa of cervical origin is cured in 60 per cent, and improved in about 30 per cent; 80 per cent of the patients remain sterile after operation, owing either to a narrowing of the external os or to stenosis of the cervical canal from contraction of the scar tissue. A pregnancy after amputation has not more than an even chance of going to full term, in which case considerable difficulty will usually be met with, owing to the unyielding scar tissue. Consequently, the operation should be avoided if possible during the child-bearing period.

Intramural Abscess.—Harrigan[9] reports a case arising in the puerperal uterus, treated by hysterectomy, with recovery. He reviews the literature of 34 cases, all of which were puerperal. In 23 the abscess was single, in 11 multiple; 9 ended fatally.

Myoma.—Ellice MacDonald[10] reviews the results of treatment of 700 cases. He finds that the menopause does not cure fibroids, and increasing age brings increasing danger from these tumours. There is little fear of malignancy in fibroids before the fortieth year, but the danger increases with every year after that age. In twenty-seven per cent the tubes are diseased, so that they should be carefully examined, and removed if necessary. In view of the various degenerations which may take place in fibroids they should be removed early if causing symptoms.

Bland-Sutton[11] compares the results of the operation of abdominal hysterectomy for fibroids and for cancer of the neck of the uterus. He is of opinion that the explanation of the difference is simple and interesting, and depends mainly on the bacterial flora of the uterus. In 1910 the operative mortality for operations for the above conditions performed at seven London hospitals was 2·4 per cent and 16 per cent respectively. He estimates that 1 per cent of patients who have submitted to abdominal hysterectomy for fibroids die suddenly during convalescence, from pulmonary embolism. This fatality is more frequent after total than after subtotal hysterectomy, and the risk is highest of all after abdominal hysterectomy for cancer of the cervix uteri. He considers that the emboli frequently arise from the deep epigastric veins, which may become thrombosed from damage with metal retractors or from infection spreading from buried sutures in the abdominal wall; he thinks that the infection of the sutures is due to the surgeon's hands becoming infected by touching the cervical canal after amputation of the uterine body. The cervical canal is sterile in the majority of women, especially virgins; but in parous women with patulous cervices, various organisms are present. He guards against this danger by swabbing out the canal with iodine in subtotal hysterectomy, and in total hysterectomy by swabbing the cut edges of the vagina.

REFERENCES.—[1]*Presse Méd.* 1913, 427; [2]*Johns Hop. Hosp. Bull.* 1913, 211; [3]*Surg. Gyn. and Obst.* 1913, i, 290 (abst.); [4]*Brit. Med. Jour.* 1913, ii, 721; [5]*Surg. Gyn. and Obst.* 1913, i, 304; [6]*Ibid.* 265; [7]*Ibid.* 272; [8]*Ibid.* 300; [9]*N.Y. Med. Jour.* 1913, i, 444; [10]*Amer. Med.* 1913, i, 161; [11]*Brit. Med. Jour.* 1913, i, 265.

UTERUS, DISPLACEMENTS OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.
Bryden Glendining, M.S., F.R.C.S.

Retroflexion.—Donald and Fletcher Shaw[1] maintain that the symptoms associated with retroflexion, such as menorrhagia, metrorrhagia, dysmenorrhœa, pelvic pain, miscarriage, and sterility, are not due to the displacement, and all that is required to cure these symptoms is dilatation and curettage. Any fixation operation is unjustifiable unless curettage has been tried and twelve months have elapsed since the trial. In all cases in which curettage fails, some condition other than simple retroflexion will be found.

[illegible][2] describes a method of **Shortening the Round Ligaments** for retroflexion and retroversion, which he claims is superior to those at present in common practice. It consists in dissecting out the round ligament in the inguinal canal just over the internal abdominal ring;

a loop of the ligament is pulled up and stitched to the posterior sheath of the rectus. The advantages claimed are that the operation is extraperitoneal, and the ligament is shortened at the expense of the weak distal portion. The disadvantages are that two incisions are made instead of one; if the uterus is adherent in the pouch of Douglas, the operation is useless; and if the ligaments are thin and atrophied, the operation is of little value.

Prolapse of Uterus and Vaginal Walls.—W. J. Mayo[3] reviews the results of operative treatment in 629 cases, which he divides into three classes, the treatment varying with each. (1) In patients during the child-bearing period, usually with supravaginal elongation of the cervix, there is usually little cystocele or rectocele. The operations generally performed are amputation of the cervix, and extraperitoneal round-ligament shortening combined with perineorrhaphy. Occasionally the utero-sacral ligaments are shortened too. (2) In patients from forty-five to fifty-five years of age, and unlikely to bear children again, cystocele is the most marked feature. They are usually treated by the vaginal fixation operation of Wertheim, in which the bladder is separated from the vagina and uterus, and the uterus is then acutely anteverted and fixed between the vagina and bladder. Amputation of the cervix is often combined with this operation. This cannot be done when the uterus is atrophic. (3) For patients past the menopause, with atrophic uteri and procidentia, he removes the uterus, ovaries, and tubes, and fixes the upper part of the vaginal wall to the cut ends of the broad and round ligaments. He calls this "vagino-pelvic fixation," and has obtained very good results from it.

Ventrofixation.—At a discussion at the Royal Society of Medicine[4] Griffith considered the following indications for this operation. *Class I.* contains cases in which the uterus is *retroverted*. Ventrifixation may be called for if the uterus is more or less fixed by adhesions, or pressed down by a tumour, usually ovarian, in a position of retroversion; or after a fibroid has been enucleated; or when retroversion is complicated by prolapse and enlargement of the ovaries (a constant source of pain unrelieved, and in some cases increased, by the pressure of a pessary); or when the retroverted uterus is not kept in position by a pessary owing to the small size of the cervix or the dilated condition of the vagina. *Class II.* comprises patients with *prolapse* of the uterus and vaginal walls, with great enlargement of the vaginal orifice. The operation is usually done after curetting and perineorrhaphy or colpoperineorrhaphy.

Giles described his operation, which he calls **Hysteropexy.** He had performed it in 508 cases, 368 of which he had been able to trace. He found that in over 90 per cent of these, the general health was improved and the symptoms were relieved; that the position of the uterus was uniformly good in 95 per cent; that hysteropexy when followed by pregnancy caused no complications in labour; and that pregnancy after hysteropexy did not disturb the position of the uterus. Of his last 200 cases, 40 per cent were for retroversion, 20 per cent for prolapse, and 13 for procidentia. In the last two groups he combined it with some operation for vaginal repair.

Spencer had only done the operation 27 times in 1000 abdominal sections. He considers ventrofixation and ventrosuspension, as usually performed, dangerous and unscientific operations, giving rise to peritoneal bands, which had many times led to strangulation of the bowel. For procidentia after the menopause, he considered the operation a useful adjunct to colporrhaphy and perineorrhaphy, but care should be taken to close the peritoneum completely over the bladder. Hubert Roberts considered that the greater number of cases of backward displacement did not require operative treatment. He had done the operation in a few cases when symptoms were definite, electing Gilliam's method in young women, and ventrofixation in women past the child-bearing age.

Tate had performed the operation in 44 cases; in 25 the after-history had been obtained, and seven had borne one or more children without any complication either in pregnancy or labour. He thought this good result was due to the fact that the fixation sutures were passed through the lower part of the uterus, leaving the fundus free. He only advised the operation in cases where pessaries and other methods failed to relieve symptoms. He had also found the operation useful in some distressing cases of incontinence of urine due to weakness of the bladder sphincter. He explained this on the ground that by fixing the uterus the neck of the bladder was also supported.

References.—[1]*Pract.* 1913, i, 961; [2]*Jour. Amer. Med. Assoc.* 1913, i, 1042; [3]*Ibid.* 1912, ii, 1421; [4]*Brit. Med. Jour.* 1913, i, 713.

VACCINATION. *E. W. Goodall, M.D.*

Harsch[1] draws attention to cases of what he and others believe to be a local anaphylactic phenomenon in vaccination. In this a primary vaccination is performed, and either fails or the local reaction is feeble. After a time another vaccination is done, which is successful. At or nearly at the same time as the lesions appear at the site of revaccination, similar lesions appear at the site of the primary vaccination. This phenomenon (which seems to be the equivalent in man of Arthus' phenomenon in the rabbit) is not common.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1913, i, 469.

VAGINAL SARCOMA. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*
Bryden Glendining, M.S., F.R.C.S.

Flood[1] describes two cases of sarcoma of the vagina, one occurring in a child aged 1½ years, the other in a multipara aged 45. The tumours were removed, but in each case the patient died from recurrence in less than six months. Both growths were round-celled in type. He considers sarcoma of the vagina to be a very deadly type of new growth, and regards as essential a careful examination under anæsthesia of all infants suffering from discharge from the genital tract.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1913, ii, 512.

VARICOSE VEINS.

Priestley Leech, M.D., F.R.C.S.

Geinitz, of Garré's[1] clinic in Bonn, publishes the results of the treatment of six cases by *spiral incision* of the skin. Friedel,[2] Kayser,[3] and Bercher[4] have recorded very favourable results obtained by this method. Geinitz was not pleased with the immediate results, but in seeing the cases a year and a half later found all but one very improved and relieved. He recommends the operation in cases where there are numerous diffuse varices for which the ligature of a vein is not suitable. Where there is atrophy of the skin, or thrombosis of the deep veins, the operation is not to be recommended.

Saphenous-femoral Anastomoses.—Weichert, of Breslau,[5] reports five cases in which he made an anastomosis between the saphena vein near its opening into the femoral vein and the femoral artery. The saphena was divided, and implanted into the artery. The final results were not so good as were expected, and not such as corresponded to the difficulty and magnitude of the operation. The improvement was slight; the swelling diminished, the ulcers have healed, the cramps in the calf are less, and the walking is easier.

References.—[1]*Münch. med. Woch.* 1913, June 10; [2]*Arch. f. klin. Chir.* 1908, lxxxvi; [3]*Bruns' Beit. z. klin. Chir.* 1910, lxviii; [4]*Zentralb. f. Chir.*, 1911, No. 13; [5]*Berl. klin. Woch.* 1913, 1396.

VENA CAVA INFERIOR, THROMBOSIS OF.

Carey Coombs, M.D., M.R.C.P.

From the cases reported by Shattock,[1] Parkes Weber,[2] and Willett and Maechtle,[3] several facts of practical importance emerge. In the case of the last named, pregnancy or the puerperium, or both, appeared to be responsible for the lesion; one of Weber's cases was manifestly due to typhoid infection; while in his other, and in that described by Shattock, an injury was to blame. In the former the injury was from without, in a carriage accident; in the latter it was internal, and due to the excessive intravenous strain of a 120 yards hurdle race. The possibility of a traumatic origin has an obvious medico-legal significance.

It is also important to realize how favourable a course this apparently serious malady may run. Shattock's patient lived twenty-five years after his accident, dying eventually of septicæmia, while Weber's patients, seen ten and seven years respectively after the first examination, showed no signs of advance in the affection. The woman seen by Willett and Maechtle was able to resume her household duties without inconvenience. The presumption is that, granted an efficient collateral circulation, a patient can do passably well without his inferior vena cava. This should be remembered in connection with life insurance and other prognostic problems.

References.—[1]*Brit. Med. Jour.* 1913, i, 385; [2]*Münch. med. Woch.* 1913, 1434; [3]*Jour. Amer. Med. Assoc.* 1913, ii, 1878.

VERRUGA PERUANA. *Leonard Rogers, M.D., F.R.C.P.*

H. N. Cole[1] has studied the comparative histology of this disease in man and in apes. He failed to find any of the numerous supposed parasites of the disease which have been described by different workers. Monkeys could be infected by inoculation from the local lesions, so they are probably due to an undiscovered parasite. The tumours are granulomatous in type, characterized by dilatation of the lymph-vessels, choking with mono- and polymorphonuclear leucocytes, and surrounded by a cellular infiltration, and extravasation of red corpuscles.

REFERENCE.—[1] *Jour. Cutan. Dis.*, 1913, 384.

VERTIGO. (*See also* LABYRINTHITIS.) *Geo. L. Richards, M.D.*

Vertigo and Labyrinthine Disease.—Lake[1] considers chronic progressive middle-ear deafness and arteriosclerosis the cause of the majority of cases of aural vertigo, which may be divided into three causative classes: (1) That due to peripheral causes (chronic middle-ear deafness, hæmorrhage and embolism into the labyrinth, and traumatism); (2) That due to increased or diminished blood-pressure; (3) Vertigo due to general systemic causes, such as leukæmia, from casual or occasional causes like gout or gouty dyspepsia, specific causes, cerebral anæmia simulating aural vertigo, and vertigo combined with ocular symptoms. A large majority of cases arising from peripheral causes or arteriosclerosis find relief from the use of drugs. Operation is only justifiable when the deafness is of negligible quantity, and the accompanying tinnitus and vertigo make the patient's life intolerable. The operation is certain to obtain relief for the patient, and has no risks. He places but small reliance on the rotary and caloric reactions, and finds that both diagnosis and prognosis can be made equally well without their employment. With reference to increased labyrinthine pressure, although he has treated at least 20 cases of labyrinthine vertigo where there had been no perforation into the labyrinth, and in 14 of which where there had been no previous suppuration, in only 2 cases did he see any fluid on opening the labyrinth. In these there was a considerable amount of fluid, and one had an extremely large external semicircular canal. Even here he is not prepared to say that the fluid was under pressure; in fact he thinks it difficult to understand, from a purely mechanical point of view, how fluid can be retained under pressure in such a non-vascular, bony cavity as the labyrinth. He has found cases of labyrinthine hæmorrhage to be absolutely beyond the reach of medicines. In labyrinthine cases, **Pilocarpine** should be tried, increasing the dose as rapidly as is consistent with safety, and continuing it for about two weeks. In arteriosclerotic cases, he confines himself to **Hydrobromic Acid**, with a small dose of **Quinine** or **Iodide of Potassium**. In the so-called Ménière's disease, he uses small doses of quinine with hydrobromic acid.

Milligan[2] considers the **Operative Treatment** of labyrinthine vertigo in non-suppurative diseases of the internal ear, and limits surgical intervention to such cases as have failed to respond to prolonged general and local treatment, and to those in which it is necessary to secure rapid destruction of a very excited and irritable labyrinth, as determined by caloric and other tests. Post-operative increase of deafness hardly requires consideration, as with an increase of irritative symptoms there is a progressive loss of hearing, in addition to which the amount of hearing at the time of the contemplated operation is, as a rule, so small as to be almost a negligible quantity. In careful hands the risks of facial paralysis are not great, provided that the field of operation is kept thoroughly well illuminated, that some form of labyrinth chisel (e.g., Lake's) is used to open the semicircular canals and the cochlea, and that no attempt is made to lever out pieces of bone, utilizing the body wall of the Fallopian aqueduct as a fulcrum. The destruction of the terminal filaments of the vestibular nerve should be as thorough as possible. The more thorough the operation, the less the amount of post-operative shock. For this reason, a complete opening up of the external semicircular canal and of the ampullary orifice of the posterior canal is advocated in order effectually to destroy the peripheral terminations of the vestibular nerve. When tinnitus is not much complained of, and when it is worth while attempting to preserve whatever auditory function is still left, operative interference should be limited to the opening up of the external semicircular canal and vestibule after the performance of an ordinary Schwartze operation.

Bradburne[3] finds that the examination of affected cases of disease of the labyrinth shows that in a majority there is an ocular disturbance in the maintenance of parallelism of the vertical meridians; that when disease tends to invade the deeper parts in the neighbourhood of the auditory organ, an ocular imbalance follows, which is manifest in a difference in the elevation of the eyes.

REFERENCES.—[1]*Ann. Otol.* 1912, Dec.; [2]*Laryngology*, 1912, Oct.; [3]*Brit. Med. Jour.* 1912, Oct.

VISCEROPTOSIS.

Robert Hutchison, M.D., F.R.C.P.

PATHOLOGY.—Lynch,[1] in a paper on gastroptosis and coloptosis transversa, as seen in post-mortem examinations, arrives at the following conclusions as to their etiology: That they are secondary and not primary conditions; that the underlying cause in both is a weakening and relaxation of their supporting structures consequent to some wasting disease, supplemented materially in the case of the colon, and to a less extent in that of the stomach, by an actual myasthenia of their walls, allowing an accumulation of contents; that the emaciation is primarily the cause of the conditions, but the establishment of a vicious cycle is likely if the prolapse interferes with the digestive function; that the high percentage of occurrences of these conditions frequently seen in literature, is not borne out by post-mortem examination.

TREATMENT.—The advisability or otherwise of operative treatment in visceroptosis is still much disputed. J. W. Smith,[2] in a paper describing operations which he has performed for displacement of the intestine (enteroptosis), regards it as a condition which largely escapes recognition in practice, and makes the surprising statement that he cannot remember a single instance where a case has been sent to him with a diagnosis of enteroptosis. "They come usually as gastric or duodenal irritation or ulcer, floating kidney, suspected gall-stones, or as vague cases with a view to diagnosis." He employs various operations for the relief of the condition—appendicectomy, ileo-colostomy, and intestinal resection—but unfortunately omits to state what the final results of these procedures has been as regards permanent cure. Roosing,[3] dealing with "gastrocoloptosis," puts in a plea for gastropexy, and describes in detail the technique of the operation as performed by him. Lund,[4] writing also from the surgical point of view, is much more conservative. What, he asks, is the practical surgeon to make of the mass of contradictory writing about intestinal stasis, ptosis, and the like? In the first place, a wholesome respect for the human organism as a whole, and the realization that dietetic, medicinal and gymnastic measures directed to the whole body are to be adopted in the majority of cases. He will not admit that in ptosis, *per se*, surgical treatment is in place at all. Operation is called for only by symptoms. These cases are most difficult, and demand careful individual study. Surgeons must be particularly careful in interpreting and reporting their end results. Cures will be rare, but even relief is a good deal. Conservatism and candour in reporting results are to be desired, as well as optimism and courage in proceeding with the work. With these opinions most experienced clinicians will agree.

REFERENCES.—[1]*N. Y. Med. Jour.* 1913, i, 1090; [2]*Med. Chron.*, 1913, May, 53; [3]*Ann. Surg.* 1913, i, 1; [4]*Bost. Med. and Surg. Jour.* 1913, ii, 181.

VOLKMANN'S PARALYSIS. (*See* MYOSITIS, ISCHÆMIC.)

WHOOPING-COUGH. (*See* PERTUSSIS.)

YAWS.

Leonard Rogers, M.D., F.R.C.P.

L. P. Stibbe[1] discusses the old question of the relationship of yaws to syphilis, and states that in Fiji the population are immune to the latter disease, apparently as a result of suffering from yaws during childhood. He therefore considers that the two diseases are related in some such way as vaccinia and small-pox. [If this is so, inoculation of the readily curable yaws should protect against the much more resistant infection with the *Spirochæta pallida*.—L. R.]

TREATMENT.—R. P. Cockin[2] records twenty cases of yaws rapidly cured by intramuscular injections of 0·6 gram **Salvarsan** in adults and relatively smaller doses in children. Only one case required a second dose, while two were chronic cases which had been unsuccessfully treated for eighteen months in hospital by other methods. These results are in accordance with former experience recorded in this ANNUAL.

REFERENCES.—[1]*N. Y. Med. Rec.* 1912, 415; [2]*Jour. Trop. Med.* 1912, 277.

YELLOW FEVER.

Leonard Rogers, M.D., F.R.C.P.

A. Agramonte[1] writes on yellow fever as a strictly human disease. He shows that the whole of the subsequent history of Cuba confirms the findings of the Reed Commission, and that there is no evidence whatever that animals can be infected. There have been no cases in Havana since September, 1908, in spite of a large non-immune population. The only successful inoculation yet reported in animals was in the case of a single chimpanzee, while other monkeys bitten by mosquitoes of proved infectivity produced no effect. By keeping a close watch of all suspected cases and isolating them under mosquito curtains, and fumigating the house to destroy all infected mosquitoes, the disease has practically been stamped out of the whole of the large island of Cuba.

J. H. White[2] deals with the dissemination and prevention of yellow fever at New Orleans. In the 1905 epidemic there, the prophylaxis was based entirely on the findings of the Reed Commission. The yellow-fever hospital was thoroughly screened against mosquitoes, but no disinfection of fomites and fouled bed-linen, etc., of the patients was attempted, and the laundry where they were washed was the only institution in the city to escape yellow fever during the epidemic. Patients were permitted to see their friends in hospital without danger, and no evidence of transmission of the disease, save through the female *stegomyia*, which has bitten an infected person during the first seventy-two hours of his fever, was obtained. The stegomyia is a purely domestic mosquito, and will not fly more than a very short distance in the open, so that fifty yards from an infected house is sufficient protection, while houses on each side of an infected one often escape. In preventing breeding of *stegomyia*, water-containers which cannot be regularly emptied should be screened with wire gauze of eighteen meshes to the inch, and small fish placed in permanent collections. Sagging roof gutters are a fertile source of mosquitoes, and should be abolished in the tropics, the water being allowed to fall on to the ground, as in the Panama Canal area. By isolating the sick in screened houses, destroying infected mosquitoes by fumigation with sulphur, etc., the 1905 New Orleans epidemic with 600 known cases among a population of 335,000 was thus stamped out within three months, at a cost of $325,000, or a fraction under one cent per head per diem.

REFERENCES.—[1]*N.Y. Med. Jour.* 1912, ii, 465; [2]*Amer. Jour. Med. Sci.* 1913, i, 378.

Part III.—Miscellaneous.

PUBLIC HEALTH:

Including

I. MEDICO-LEGAL AND FORENSIC MEDICINE.
II. STATE MEDICINE (INCLUDING LEGAL DECISIONS).
III. INDUSTRIAL DISEASES AND TOXICOLOGY.

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I. MEDICO-LEGAL AND FORENSIC MEDICINE.

IMMUNITY OF TRADE UNION FUNDS.

A case in the Edinburgh Court of Sessions again emphasizes the fact that trade unions are exempt from actions in respect of any tortious acts alleged to have been committed by or on behalf of such unions, under s. 4 (1) of the Trade Disputes Act, 1906. The case was an action for alleged slanders brought by an ex-official of the National Sailors' and Firemen's Union of Great Britain and Ireland against the Union and its officials and trustees. The action was dismissed with costs.

Medical Unions registered under the Trade Union Acts would be exempt in the same way and for the same reasons.

LIABILITY OF PANEL MEDICAL OFFICER.

In the Liverpool County Court it was held, during 1913, that a panel medical officer was liable to action in the ordinary legal Courts for negligence or neglect of duty. An "insured" person claimed against a panel doctor for a sum of money expended for medical services by another medical man, owing to the refusal of the panel doctor to attend. The County Court Judge entered judgment for the plaintiff with costs.

The remedy for such a case as neglect or non-attendance is not only that provided under Regulations made under the National Insurance Act—the so-called Disciplinary Regulations in connection with "medical benefit," or under the Act itself (s. 67 (2)), but also that provided through the ordinary legal channels in use before the National Insurance Act came into force.

CANVASSING BY FRIENDLY SOCIETIES FOR MEDICAL OFFICERS.

An important decision was given in the case of DR. YOUATT *v.* WRIGHT in the Chancery Court for the County Palatine of Lancaster at Liverpool, on December 1, 1913. The plaintiff complained that the Friendly Societies' Association of a certain district, through their officers, without his consent, procured, by means of canvassing and touting, persons (juveniles) as patients, in such a manner that, if the same were done with the sanction or even acquiescence of the plaintiff, it would amount to "an act of infamous conduct" on his part within the meaning of s. 29 of the Medical Act of 1858. The plaintiff did everything he possibly could to prevent the canvassing and touting on his behalf. The action was dismissed, the Court stating that no relief could be given to the plaintiff, having regard to the fact that the patients were juveniles who were treated as private patients at the expense of the Friendly Societies concerned.

Garnisheeing of Fees due to Panel Medical Officers from Insurance Funds.

It was decided in a County Court that a garnishee order must be issued, on application, against the fees due to a panel medical officer from Insurance funds, but that the Court had power to return portion of the arrested sum to such panel medical officer.

Operations under the Children's Act.

An interesting point has been decided in connection with the Children's Act, 1908. Is a parent justified in refusing an operation upon a child on the plea that such parent does not believe in operations? Is such a refusal neglect to provide adequate medical aid within the meaning of the Act? The Magisterial opinion has been expressed to the effect that the parent was under no legal liability to allow an operation to be performed. On appeal, however, the Court has taken a different view, holding that, under the Act, in certain instances, operations are necessary, but that such operations must be reasonable. Each case must be decided upon its merits, due regard being paid to the nature of the operation as well as to its necessity.

Workmen's Compensation Act.

Several interesting decisions have been given during 1913 under the Workmen's Compensation Act, and these may, with advantage, be put on record for convenient reference, as follows:—

1. Disease versus Accident.

(a). *Appendicitis as an Accident.*—This was the case of Brewster v. Bradford & Co. A workman, whilst at work, fell from a ladder a distance of thirteen feet, complaining of having received an injury therefrom. Some time afterwards, an operation for appendicitis was performed upon him, and a tin-tack found in the appendix. The man died, and his relatives claimed compensation. The County Court Judge decided that death was due to appendicitis caused by a foreign body (a tin-tack) being in the appendix, and that the fall did not "light up" the tin-tack. (*Vide* Medical Annual, 1912, 593, and 1913, 578.)

(b). *Pneumonia as an Accident.*—This was the case of Walls or Drylie and Others v. The Alloa Coal Company Limited. John Drylie was employed in a pit, and whilst so employed contracted a chill, which was followed by pneumonia, from which he died—thirteen days after contracting the chill. Whilst at work, water accumulated at the pit bottom, and the deceased stood in cold water up to the knees, with a draught of cold air playing upon his body, for a period of about twenty minutes. The pit was known in the trade as a wet pit. The Sheriff-Substitute found that the pneumonia from which Drylie died was due to the chill, which he contracted whilst at work, and that, therefore, the death resulted from injury by accident arising out of, and in the course of, employment. Compensation was allowed, and, on appeal, the Sheriff-Substitute's decision was upheld, with costs.

By this decision, death from disease may be an "accident" when such disease can be definitely collocated in the relation of effect and cause with some unusual, unexpected, and undesigned event arising at an ascertained time out of the employment. If the conditions under which work is carried out be normal, no claim for compensation should succeed, such as in the case of JOHN BROWN *v.* THE CHESTERFIELD COLLIERY LIMITED. John Brown was at work in a mine, and the work was stopped owing to a wreck in the shaft, the men being ordered up to the pit head by another shaft, but being kept waiting in a cold draught for about an hour and a half. Brown contracted a chill, pneumonia ensued, and the man died seven days after contracting the chill. The Sheriff-Substitute awarded compensation, but, on appeal, his decision was reversed, on the ground that there was nothing abnormal in the circumstances in which the deceased found himself.

2. MISCELLANEOUS POINTS.

(*a*). *Court of Session.*—That in making a post-mortem examination with a view to finding out the cause of death (whether due to an accident as alleged or not), a medical man did not act illegally, whilst the deceased's relatives' feelings were not really hurt, as such relatives caused further examinations to be made of the dead body by independent doctors, on account of the first doctor's examination showing that death was not the result of an accident.

(*b*). *Court of Session.*—That a complainer is entitled to, and must be furnished with, a copy of the report of the doctor who examined such complainer on behalf of the employers.

II. STATE MEDICINE, INCLUDING LEGAL DECISIONS.

Bacterial Food Poisoning and Food Infections.

Food sometimes causes symptoms of poisoning (more or less severe) in persons partaking of it, and the question of so-called ptomaine poisoning has been discussed and reported upon from time to time. The Local Government Board have, during 1913, published a report on the whole subject, tabulating all the known outbreaks for years past—70 British and 44 Continental. The meat suspected is generally in a made-up form, e.g., meat pies, sausages, brawn, etc.; but other articles of food have also given rise to similar outbreaks, e.g., sardines, salmon, etc. The poison is the same in all—certain pathogenic organisms or their spores or toxins, generally the Gaertner group of bacilli; these may be of human or of animal origin, generally the latter, the animals suffering from the disease due to the particular Gaertner or other bacillus, or acting as "carriers" of such bacillus. The incubation period varies, being longer or shorter according as to whether or not toxins are present in small amounts. The symptoms are those of gastro-intestinal irritation: pains in various parts of the body, rashes, cramps, headache, giddiness, depression, and even coma and death. The infectivity and case-mortality rates vary. The *preventive measures* are: (1) Meat inspection at time of slaughter; (2) Separation of slaughter-houses and food-preparing places; and (3) Cleanliness generally.

Galvanized Iron Water Pipes.

An attack has been made recently upon the use of galvanized iron water pipes, on the ground that the coating of zinc is so thin as readily to suffer injury and a breach of continuity. The co-efficient of expansion and contraction for each metal is different, so that the adhesion of the one metal to the other is seriously affected if the pipe is subjected to extreme variations of temperature. Soils act injuriously upon both zinc and iron. Soft waters and waters containing inorganic impurities, especially when slightly acid, attack zinc, iron, and lead quickly and seriously. When the zinc of the inside of a galvanized pipe is dissolved off in parts, electric couples are created, with the result that the dissolving process goes on more quickly, all galvanizing from the inside of the galvanized pipe disappears, and symptoms of irritant poisoning from the dissolved zinc show themselves in the consumers of the water passing through such pipes. In Austria, it is stated, galvanized iron pipes are not allowed to be used for water supplies.

Insect Porters of Bacterial Infections.

The Horace Dobell Lectures, given before the Royal College of Physicians, have crystallized existing knowledge on the subject of insect carriers or porters of infection, e.g., house flies in relation to typhoid fever, infantile diarrhœa, etc. In regard to diarrhœa epidemics, the following conclusions seem to be warranted: (1) The fly-carrier hypothesis is the only one which offers a satisfactory interpretation of the extraordinary dependence of the epidemic upon the accumulated effect of temperature; (2) It offers a ready explanation of the spread of infection to neighbouring children who have no direct personal contact with the patient. (3) The peculiarities of the relation in time between fly prevalence and the epidemic in different localities are not inconsistent with the view that fly-carriage is essential to epidemicity.

Other matters dealt with in the Lectures are: (1) The transmission of plague by fleas, and the mechanism by which the flea might infect a healthy animal, the distribution of plague bacilli in the flea's body, the transmission of the plague bacillus from rat to rat, and from rat to man through the flea of the rat, the importance of flea transmission in epizootics, etc.; (2) The transmission of typhus by lice, and the mechanism by which the louse might carry infection; (3) The transmission of African relapsing fever by the tick (*Ornithodoros moubata*) and of the English, Russian, American, or Indian variety by some insect not yet discovered; (4) The transmission of poliomyelitis by *Stomoxys calcitrans* (as stated by Rosenau, Anderson, and Frost).

The bed-bug (*Cimex lectularius*) is suspected of carrying infection in certain diseases, but the bulk of evidence is against such a theory. There are no larval or pupal stages, the insect emerging from the egg as a little bug; again, a bug feeds, and then retires to some secluded spot and slowly digests the meal, which it requires only at intervals of several days; and, finally, experimental transmissions have proved negative in relapsing fever and typhus; but, in the case of plague, have proved positive, though there is no epidemiological reason for supposing such a transmission takes place in nature to any extent. Long intervals between meals, the lengths of time the insects retain a meal, and the extent to which it is digested before being excreted, are points that may explain the reason why bed-bugs do not transmit disease as do fleas and lice.

(*See also* PELLAGRA; POLIOMYELITIS; SPIROCHÆTOSIS, etc.)

TUBERCULOSIS.

Notification.—All forms of tuberculosis (non-pulmonary as well as pulmonary) became compulsorily notifiable under the new General Order of the English Local Government Board, known as the Public Health (Tuberculosis) Regulations, 1912, which came into force on February 1, 1913. More than half of the deaths from non-pulmonary tuberculosis are those of children under five years of age, and it is probable that a much higher percentage of the total number of persons suffering from non-pulmonary tuberculosis are children of that age. Much good is expected to accrue from the notification of these cases, not only in investigating sources of infection, but also in securing improvement in the conditions under which the children live. Notification is to be made on the strength of evidence other than that derived solely from tuberculin tests, and the notification is: (*a*) Primary; and (*b*) Supplemental. Primary notification is to be made on a special form to be supplied by the Authority, and is required in respect of every case of tuberculosis, whatever organ be affected, unless the practitioner has reasonable grounds for believing that the case has been already notified. Primary notifications are to be made by private practitioners, district medical officers of Poor Law Unions, medical officers of tuberculosis dispensaries, and medical officers of hospitals, and school medical inspectors (the last-named on a special form), The supplemental notifications have reference to admissions into, and discharges from, Poor Law institutions or sanatoria, weekly. The fees to be paid are set out in the Schedule to the Regulations, but no accounts for fees need be sent in by the notifiers by filling up counterfoils, as was formerly the case under previous Regulations and Orders, which are revoked by the new Order.

These new (1912) Regulations consolidate and amend all previous ones, and extend the compulsory notification to all forms of tuberculosis, so that pulmonary and non-pulmonary cases come under official cognizance and administration. In this way, the notification is brought into line with the "Sanatorium" benefit of the Insurance Act, which also deals with all forms of tuberculosis, and not, as is often stated, with the pulmonary form only, i.e., phthisis. The field of investigation is much widened, and the work of Sanitary Authorities much increased; for it is not expected that matters will stop at the simple notification of the disease and the tabulation of statistical results, but, on the contrary, the Local Government Board states that patients' homes are to be visited officially, and enquiries made with a view to finding out, and dealing with, any conditions likely to cause the disease to spread.

Tuberculosis in Milk.—During 1913, a new Tuberculosis Order has been issued by the Board of Agriculture and Fisheries, and came into operation on May 1st. Under the Order, the Treasury will refund to local authorities half the net amount payable by way of compensation for animals slaughtered during a period of five years from the coming into operation of the Order. The Order accepts, as a fact, that tuberculosis is transmissible by the agency of milk used for human consumption, and that, consequently, reduction of the number of tuberculous bovine animals in the country must reduce the risk of the spread of tuberculosis amongst the community. With this object in view, an endeavour is to be made to destroy every cow found to be suffering from tuberculosis of the udder or to be giving tuberculous milk, as well as all bovine animals which are suffering from tuberculosis with emaciation. The forms of tuberculosis laid down in the Order are definite, and may be extended hereafter by future Orders as may be found desirable. For the present, however, it is the wish of the Board that Local Authorities should proceed cautiously, so as not to interfere with an adequate milk supply or disorganize the important milk industry. Heroic measures taken at the present time might defeat their own object. The terms of compensation are definitely laid down in the Order, the animal slaughtered to be valued in its condition at the time. Thus, if post-mortem examination shows no tuberculosis, the compensation payable is to be the full value of the animal, together with a further sum of twenty shillings. If tuberculosis is found on post-mortem examination, the compensation payable is to vary with the extent of the disease found—the less the disease, the more the compensation. Advanced tuberculosis carries a compensation of one-fourth of the value of the animal or a sum of thirty shillings (whichever sum is greater after deducting from such sum one-half of the costs of valuation and examination). Tuberculosis which is not advanced carries a compensation of three-fourths of the value of the animal after deducting one-half of the costs of valuation. The Order also gives powers in respect of the milk of suspected animals and the detention and isolation of such animals whilst under suspicion. The Order applies to England and Wales and Scotland, and a similar Order for Ireland came into operation on June 1, 1913. Much good must eventually be the outcome of these Tuberculosis in Milk Orders, especially in the case of children who suffer from tuberculosis of bovine origin—surgical tuberculosis.

VENEREAL DISEASES.

The International Medical Congress drew official attention to the ravages of syphilis upon health, deploring at the same time the inadequacy of existing facilities for checking its dissemination, and suggesting to all Governments concerned the following: (1) To institute a system of confidential notification of the disease to a Sanitary Authority wherever such notification does not already obtain; (2) To make systematic provision for the diagnosis and treatment of all cases of syphilis not otherwise provided for. There is, of course, no desire to revive the objectionable Contagious Diseases Acts. The Government quickly took the matter up, and appointed a Royal Commission on Venereal Disease, under the chairmanship of Lord Sydenham, with Mr. E. R. Forbes, of the Local Government Board, as Secretary. The terms of reference are: to enquire into the prevalence of venereal diseases in the United Kingdom; their effects upon the health of the community, and the means by which those effects can be alleviated or prevented, it being understood that no return to the policy or provisions of the Contagious Diseases Acts of 1864, 1866, or 1869 is to be regarded as falling within the scope of the enquiry.

In addition, the Local Government Board has issued a Report on "Venereal Diseases" (published by Wyman & Sons, Limited), in which it is laid down that the best method of controlling venereal diseases and protecting those free from infection would be the provision of means for early and accurate diagnosis, with skilled advice and adequate treatment available for all infected persons. Particulars are given of the arrangements at present available in England and Wales for institutional treatment of these diseases—arrangements that are wholly inadequate for the needs of the country, whether regarded from the point of view of hospitals or of workhouse infirmaries. The use of salvarsan and the application of the Wassermann test should not only be introduced, but systematically carried out, at all public institutions. It is noteworthy that the Report expresses the opinion that the time is not yet ripe for making venereal diseases compulsorily notifiable, until a more reasonable attitude towards the whole question has penetrated the popular mind.

Some authorities are already taking action in regard to diagnosis of syphilis by offering the Wassermann blood-reaction test free of charge to medical practitioners attending the poorer class of patients in their districts. Outfits are provided for the purpose, and the test is used both for diagnosis and for ascertaining the efficacy of treatment.

LEGAL DECISIONS.

The following legal decisions, given during 1913, are important in their relation to State Medicine and Sanitary Administration :-

I. Adulteration of Food and Drugs.

Anderson v. *Britcher* (*King's Bench Division*).

Sale of Food and Drugs Act, 1875, s. 6—*Demerara sugar—Reference to process used in trade.*

Demerara sugar was demanded, and sugar grown in Mauritius, consisting of cane sugar crystals coloured with an organic dye, was given by the vendor. The magistrate held that "Demerara sugar" had become a generic term referring to a process of manufacture, and not to a place. On appeal, the Court *upheld* the Magistrate's decision. *Appeal dismissed.*

Grimble & Co. v. *Preston* (*King's Bench Division*).

Sale of Food and Drugs Act, 1899, ss. 19(2)–20(6)—*Vinegar—Pure malt vinegar—Warranty—Failure to serve copy of Analyst's certificate.*

Vinegar manufacturers gave a warranty (invoice) with vinegar that they sold as pure malt vinegar. Analysis showed only 0·024 per cent of phosphoric acid. A copy of the analyst's certificate was not served with the summons. The Justices convicted. *Held*, on appeal, that as objection had not been taken to the non-service of the analyst's certificate, the conviction was in order. *Appeal dismissed.*

Ross v. *Helm* (*King's Bench Division*).

Sale of Food and Drugs Act, 1875, s. 6—*Evidence and proof of appointment of Inspector—Purchase of whiskey sold to the prejudice of the purchaser.*

A sample of whiskey was found to be not of the nature, substance, and quality demanded, and a summons was taken out against the vendor, but was dismissed on the ground that the inspector did not produce his appointment nor prove that he was a duly authorized officer. On appeal, it was *held*, that it was not necessary to prove that the appellant was an inspector in a prosecution under s. 6 of the Sale of Food and Drugs Act, 1875, and further, that there was *prima facie* evidence that the appellant was, in fact, an inspector.

Appeal allowed and case remitted.

Marshall v. *Skett* (*King's Bench Division*).

Sale of Food and Drugs Act, 1875, s. 6—*Milk deficient in fat—Evidence of offence—Excess of fat in another consignment of same milking.*

A sample of milk showed, on analysis, 26 per cent deficiency in fat, and a summons was taken out against the vendor, who, when the case was heard, put in, in evidence, that another consignment of the same morning's milk from the same cows showed, on analysis, 3·1 per cent excess in fat. The information was dismissed by the Justices, but, on appeal, it was *held*, that, on the evidence of the analysis in regard to the sample taken by the inspector, the Justices ought to have convicted. *Appeal allowed and case remitted.*

2. CRIMINAL LAW.

Rex v. *Pridmore (Court of Criminal Appeal).*

Criminal Law—Evidence of common purpose—Two poachers with one gun.

Night poaching by two poachers, one armed with a gun and the other carrying a stick, was interrupted by gamekeepers, one of whom was shot in the face by the gun. The jury found both prisoners guilty of shooting with intent to murder, but stated that they were unable to say which man fired the shot, but that the intention was to act with a common purpose, viz., to prevent arrest. No evidence was given at the trial of any arrangement, actual or implied, made between the two poachers. On appeal, it was *held*, that the jury were justified in assuming a common purpose, viz., to prevent arrest, from the actions of the prisoners (the poachers) when pursued by the keepers.

Appeal dismissed.

Rex v. *Gross (Central Criminal Court).*

Criminal Law—Intent to kill one person but actually killing another is manslaughter.

Prisoner went to a house for the purpose of killing with a shot from a revolver a woman with whom her husband was living. The husband struck the prisoner, who, incensed thereby, fired at him, but killed, by accident, the woman with whom the husband was living.

Verdict: guilty of manslaughter.

3. DRAINS AND SEWERS.

(*a*) *Kershaw* v. *Smith & Co. Ltd. (King's Bench Division).*

Metropolis Management Act, 1855, ss. 85, 250—Metropolis Management Amendment Act, 1862, s. 64—Drainage by combined operation—Plan not carried out as approved by Local Sanitary Authority.

Twelve houses and shops were allowed to be drained in combination, as shewn on plan duly approved, after amendment, by the Sanitary Authority. The plan was materially deviated from, whilst, in addition, other drains were joined to the system approved on the plan. The irregularities came to the knowledge of the Sanitary Authority, who served notice upon the original owner and builder under s. 85 of the Metropolis Management Act, 1855, for the alteration of the drainage in accordance with the plan as approved, as amended, originally. The notice was not complied with, and the Sanitary Authority did the work themselves. Subsequently, a further notice was served upon the respondents under s. 85 of the same Act, requiring the "combined drain" to be taken up and all foul and polluted earth to be removed, the "combined drain" being a line of pipes which passed under the respondents' houses, and which also took other drainage from neighbouring houses. The Magistrate refused to make an order for the notice to be complied with, and dismissed the information with costs. On appeal, it was *held*, that the line of pipes had been reinstated in accordance with the plan as originally approved, as amended, prior to the service of the notice under s. 85 of the Metropolis Management Act, 1855, and that the "combined drain" was, therefore, a drain, repairable by the owner or owners concerned.

Appeal allowed and case remitted.

4. FACTORIES AND WORKSHOPS.

Owen v. [illegible] Spinning Company Ltd. (King's Bench Division).

Factory and Workshop Act, 1901, ss. 32, 128, 137—*Abstract to be fixed—Unnecessary to produce same in Court as evidence.*

A summons *re* employment of "young persons" contrary to the Act was dismissed by the Justices on the ground that the abstract, fixed in the factory, should have been produced as evidence in Court. On appeal, it was *held*, that secondary evidence can be given of the contents of a printed abstract, which is affixed in a Factory in accordance with s. 128 of the Factory and Workshop Act, 1901, even though notice to produce the said abstract has been given, as it is a document which, by s. 128, is required to be kept constantly affixed in the factory.

Appeal allowed and case remitted.

5. HOUSING OF THE WORKING CLASSES.

Ryall v. *Kidwell & Son* (*King's Bench Division*).

Housing, Town Planning, etc., Act, 1909, ss. 14, 15—*Landlord and tenant—House reasonably fit for human habitation—Person with right of action for injury sustained.*

A defective bedroom floor caused injury to a child, and an action was taken against the landlords by the child, acting through her next friend. The County Court Judge decided that the plaintiff, being a stranger to the contract between landlord and tenant, had no right of action. The plaintiff appealed, and it was *held*, that the plaintiff was a stranger to the contract and, consequently, had no right of action against the landlords. *Appeal dismissed.*

Middleton and Wife v. *Hall* (*King's Bench Division*).

Housing, Town Planning, etc., Act, 1909, ss. 14, 15—*Landlord and tenant—House reasonably fit for human habitation—Person with right of action for injury sustained.*

Defective staircase caused injury to tenant's wife, who took action against the landlord to recover damages. The High Court *held*, that, where premises are let to a tenant, and the tenant's wife suffers an injury owing to such premises being not reasonably fit for human habitation, the wife has no cause of action.

Judgment for the Defendant.

Rex v. Local Government Board: Ex parte Arlidge (Court of Appeal).

Housing, Town Planning, etc., Act, 1909, ss. 17 (6), 39 (1)—*Local Government Board Act,* 1871, s. 5—*Closing order—Refusal to determine—Appeal to Local Government Board—Right of appellant to be heard.*

This was an appeal from a decision of the Divisional Court discharging an order *nisi* for *a certiorari* to quash an order made by the Local Government Board. The Divisional Court *held*, that the Local Government Board were not bound, before determining an appeal under s. 39 (1) of the Housing, Town Planning, etc., Act, 1909, to hear the applicant personally. On appeal, it was *held*, that the Act intended the appeal to the Board to be of the nature of a *lis inter partes*, and that the Board was bound to disclose to the appellant all the evidence of fact placed before it. *Appeal allowed.*

6. Insurance Act.

(*Divisional Court.*)

National Insurance Act, 1911—*Manual labour—Lithographic artists and engravers.*

The Court *held*, that neither lithographic artists nor engravers, though they did manual work, could be said to be engaged in "manual labour," the work being really that of the brain and of the intelligence, and that they were clearly within the exception in the Act.

Judgment for defendant.

Scottish Insurance Commissioners v. *Royal Infirmary of Edinburgh* (*Court of Sessions*).

National Insurance Act, 1911, s. 1 (1), (2), *Schedule I., Part I.* (*a*)—*Infirmary staffs and contract of service.*

Held, that the following persons appointed to act in connection with an infirmary are not persons employed within the meaning of the National Insurance Act, 1911, the managers of the infirmary having no control over the manner in which these persons carried out their treatment of patients, and there being, in consequence, no "contract of service":—(*a*) Resident physicians and surgeons; (*b*) Non-resident house physicians and house surgeons; (*c*) Clinical assistants; and (*d*) Anæsthetists. *Appeal dismissed.*

7. Milkshops.

Spiers & Pond Limited v. *Green* (*King's Bench Division*).

Dairies, Cowsheds, and Milk Shops Order, 1885, *Article* 6 (1)—*Registration of trade of purveyor of milk—Occasional sales not purveying.*

The occupiers of a refreshment buffet at a railway station, selling, amongst other things, two or three glasses of milk per week, were summoned before a Magistrate for not being registered as purveyors of milk at such station. The Magistrate convicted and imposed a penalty (with costs); but, on appeal, it was *held*, that the appellants were not carrying on "the trade of a purveyor of milk" within the meaning of the Order, owing to the smallness of the sale and the fact that the sales were occasional, and that, consequently, the appellants did not require to be registered.

Appeal allowed and conviction quashed.

8. Motor Cars.

Appleyard v. *Bangham* (*King's Bench Division*).

Locomotives on Highways Act, 1896, ss. 5, 7—*Petroleum Regulations*, 1907, rr. 3, 4—*Storage of Petroleum in store-house used as dwelling—Petroleum in tanks of cars.*

Regulation 4 of the 1907 Regulations (Petroleum) prohibits the use of premises partly as a store-house for petroleum and partly as dwellings. A stable had been converted into a motor garage and the lofts above were used as dwelling-rooms, the intervening floor consisting only of ordinary lath and plaster ceiling, broken in places, with wooden beams across it. The rooms upstairs were approached by wooden stairs from the inside of the garage, which were surrounded by a casing of matchboarding. The petroleum stored was that stored in the tanks of the motor cars. The Justices held that there was no "storage" within the meaning of the Regulations; and, on appeal, the Court *held*, that it is an offence against the Regulations to use as a dwelling-house a loft having an unsubstantial floor situated above a garage in which are housed motor cars containing petroleum in their tanks.

Appeal allowed and case remitted.

Webster v. *Terry* (*King's Bench Division*).

Locomotives on Highways Act, 1896, *s.* 2—*Motor Cars* (*Use and Construction*) *Order*, 1904, *Article II.—Local Government Act*, 1888, *s.* 85 (1)—*Red light visible behind on Motor Bicycles.*

Held, on appeal, that Article II. of the Motor Cars (Use and Construction) Order, 1904, applies to motor bicycles, requiring a white light to be carried visible in front and a red light visible behind. A motor bicycle is not a bicycle to which s. 85 of the Local Government Act, 1888, applies. *Appeal dismissed.*

9. Offensive Trades.

Butchers' Hide, Skin and Wool Company Limited v. *Seacome* (*King's Bench Division*).

Public Health Act, 1875, *s.* 112—*Public Health Acts Amendment Act*, 1907, *s.* 51—*Offensive trade of raw hides—Establishment prior to Order of Local Authority.*

An offensive trade dealing with raw hides and skins was established without consent in 1911 in a certain borough, where s. 51 of the Public Health Acts Amendment Act, 1907, was declared to be in force by the Local Government Board. It was not, however, until 1912 that the Board confirmed an Order of the Borough Council, declaring the dealing in raw hides and skins to be an offensive trade. A summons was taken out against the firm, and the Justices convicted, imposing a fine and costs. On appeal, it was *held*, that the appellants were not liable to a penalty for carrying on the business, inasmuch as at the time when it was established its establishment was not unlawful.

Appeal allowed and conviction quashed.

10. Rag Flock.

(*a*). *Gamble* v. *Jordan* (*King's Bench Division*).

Rag Flock Act, 1911, *s.* 1 (1)—*Remaking mattress as against making bedding.*

Section 1 of the Rag Flock Act, 1911, requires that rag flock for the purpose of "making" upholstery or bedding shall conform to the standard of cleanliness prescribed by the Regulations of the Local Government Board. Flock manufactured from rags was found on certain premises, and was proved to be not in conformity with the L.G.B. standard. The flock had been taken from an old mattress, and was to be used again for "re-stuffing" or "remaking" the old mattress without the addition of any other flock. The flock was shown to contain 352·5 parts of soluble chlorine in the form of chlorides per 100,000 parts of the sample, i.e., 352·5 parts per 100,000 in excess of the *maximum* allowed under the Regulations.

The Magistrate held that the "restuffing" or "remaking" of the mattress was the making of an article of bedding within the meaning of the Act. On appeal to the High Court it was *held*, that the "re-stuffing" or "remaking" of a mattress does not constitute an offence under the Act, provided that the flock is simply taken out of the mattress and put back without the addition of any other flock.

Appeal allowed and conviction quashed.

11. SCHOOL MEDICAL OFFICERS.

Symes v. *Brown* (*King's Bench Division*).

Education—Non-attendance at school on account of verminous condition (alleged) of other scholars—Reasonable excuse under bylaws.

Children were kept from school on the ground that there were verminous scholars in attendance thereat, and that that fact was a reasonable excuse for non-attendance under the bylaws. The Justices refused to admit the reason assigned for non-attendance as a reasonable excuse, or to hear evidence on the point; but it was *held*, on appeal, that evidence must be taken to find if there was a reasonable excuse for the non-attendance of the children.

Appeal allowed and case remitted.

Rex v. *De Grey and Another: Ex parte Fitzgerald* (*King's Bench Division*).

Elementary Education (Defective and Epileptic Children) Act, 1899, ss. 1 (1), (3), 11—*Education (Administrative Provisions) Act*, 1909, s. 8—*Non-attendance of defective or epileptic child—Medical certificate—Magistrates' power to examine a child.*

The School Authority summoned a parent for not sending his child to school; a medical certificate was produced to the effect that the child was not imbecile and not merely dull or backward, but was, by reason of mental defect, incapable of receiving proper benefit from the instruction in an ordinary school. The Magistrate examined the child and then dismissed the summons, refusing at the same time to state a case. On appeal, it was *held*, that the Magistrate was not entitled to form his own opinion by questioning the child, but was bound to act on the medical certificate, which was not disputed.

Magistrate ordered to state a case.

12. SEWAGE DISPOSAL.

Phillimore and Another v. *Watford Rural District Council* (*Chancery Division*).

Public Health Act, 1875, ss. 4, 15, 16, 17—*Nuisance from sewage farm—Right to discharge sewage effluent—Free right of passage and running water.*

A local authority purchased land for a sewage farm site—the purchase to include the "free right of passage and running of water" from the land, so as not to create a nuisance to the vendor or his tenants. A nuisance arose, and the vendor and his tenant entered an action against the local authority before the High Court, when it was *held*, that the fact that the land was sold to be used as a sewage farm site did not preclude the plaintiffs from complaining of the discharge of the effluent over their land so as to be a nuisance.

Judgment for the plaintiffs.

Hanley v. *Edinburgh Corporation (House of Lords).*

Nuisance from flooding of sewer due to insufficient culvert—Statutory powers and duties of road and drainage authorities.

This was an action for damages from sewer flooding due to exceptionally heavy rainfall and insufficient culvert. The Lord Ordinary (Scotland) gave judgment for the plaintiffs, but his decision was reversed by the Second Division of the Court of Session. On appeal to the House of Lords, it was *held*, that there was a statutory obligation upon the Corporation to provide for the efficient drainage of the burgh, and that they were liable to damages to the pursuer.

Appeal allowed.

13. SHOPS ACT.

Ward v. *W. H. Smith & Son (King's Bench Division).*

Shops Act, 1912, ss. 1 (1), 14 (3), 19 (1)—*Weekly half-holiday—Liability of employer for assistant's infringement—Reasonable precautions to prevent.*

An assistant employed in charge of a book-stall at a railway station refused to take a weekly half-holiday on the ground that the book-stall was not a shop within the meaning of s. 19 of the Shops Act, 1912, and that therefore he, the assistant, was not an assistant within the meaning of the section. Further, the assistant contended that the papers which he sold were sold on the platform, and not inside a building or structure, as contemplated by the Shops Act, 1912. The Justices dismissed the information, but stated a case for the decision of the High Court, who *held*, that the case should be remitted for further consideration, but that the occupier of a shop under the Act commits an offence if an employee, in disobedience to instructions, works in their business in the shop after the prescribed hour, unless he shows that all reasonable precautions to prevent an infringement of the Act have been taken, and that the actual offender has been brought before the Court under s. 14 of the Act.

Appeal allowed and case remitted.

Williams v. *Gosden.*

Shops Act, 1912, s. 4 (1), (6), *and Second Schedule—Weekly half-holiday—Exemption—Sales to travellers.*

By s. 4 (6) of the Shops Act, 1912, and the Second Schedule to the Act, certain trades are exempted from the provisions of a weekly half-holiday, including the following: "the sale of motor, cycle, and aircraft supplies and accessories to travellers." A case came before the Justices, and was dismissed, on the ground that the exemption referred to all supplies and accessories to travellers, whether by motor, cycle, and aircraft, or not, and that, consequently, the trade of a saddler or harness maker selling supplies and accessories to travellers came within the exemption. On appeal, it was *held*, that the exemption does not authorize the sale to travellers of any supplies and accessories other than those connected with motors, cycles, and aircraft.

Appeal allowed and case remitted.

London County Council v. *Welford's Surrey Dairies Limited* (*King's Bench Division*).

Shops Act, 1912, ss. 4 (1), (6), 10 (1), (2), and Second Schedule—Weekly half-holiday—Exemption—Perishable articles and confectionery—Butter and rum honey.

Magistrate decided that butter and rum honey were, under the Schedule, a "perishable article" and "confectionery" respectively; but, on appeal, it was *held*, that butter was a "perishable" article within the meaning of the Schedule, but that rum honey was not "confectionery" within the meaning of the Schedule.

Appeal allowed and case remitted.

13. SMOKE.

Armitage Limited v. *Nicholson* (*King's Bench Division*).

Bradford Corporation Act, 1910, s. 53—Nuisance from the emission of smoke—Negligent stoking—Liability of occupiers.

The occupiers of a dye house were convicted for creating a nuisance by the emission of smoke from furnaces, constructed on the principle of consuming, and so as to consume or burn, the smoke arising from such furnaces. Against this conviction an appeal was lodged, on the ground that the nuisance was due to negligent stoking, and that the occupiers of the dye house were not liable for such negligent stoking. It was *held*, on appeal, that the conviction must be affirmed, as the appellants were, under the Act, criminally responsible for the negligence of their stokers. *Appeal dismissed.*

14. UNSOUND FOOD.

Cointat v. *Myham & Son* (*King's Bench Division*).

Public Health (London) Act, 1891, s. 47—Sale of Goods Act, 1893, s. 53 (2)—Damages for breach of implied warranty under contract—Meat unfit for human food—Damages to include fine, costs, and loss of business.

A retail butcher was convicted and fined (with costs) for exposing a tuberculous pig, unfit for human food, under s. 47 of the Public Health (London) Act, 1891. He entered an action against the vendor, from whom he purchased the pig, claiming damages, including fine, costs, and loss of business, and the High Court *held*, that neither the damages arising out of the conviction, nor the damages caused by loss of business, were too remote—the special loss being in fact actually in contemplation, or such as might be taken to be in the contemplation of the vendor at the time of making the contract.

Judgment for the plaintiff.

15. UNFENCED LAND.

Upham v. *Willesden Urban District Council* (*King's Bench Division*).

Willesden Urban District Council Act, 1903, s. 32—Unfenced land—Powers of Urban Authority.

Held, that, if a piece of land was not provided with a fence which was reasonably effective for the purpose of preventing persons from going on the land, it was "unfenced" within the meaning of the section, and that the question of its state was a matter for the Urban Authority and not for the Justices. *Appeal allowed.*

16. Veterinary Surgeons.

Royal College of Veterinary Surgeons v. *Kennard*
(King's Bench Division).

Veterinary Surgeons Act, 1881, s. 17 (1)—Unqualified person—Canine surgeries.

The Royal College of Veterinary Surgeons laid an information against an unqualified veterinary surgeon for using the title of "canine surgery," but the Justices dismissed the information with costs. On appeal, it was *held*, that the words "canine surgery" were a description of a place and not of a person, and that, therefore, no offence had been committed against the Veterinary Surgeons Act, 1881.

Appeal dismissed.

17. Water Supply.

Metropolitan Water Board v. *Avery* (*Court of Appeal*).

Metropolitan Water Board (Charges) Act, 1907, s. 25—Supply of water for lunch catering is a domestic supply.

At a public house, lunches were served, and the Water Board claimed extra payment for water in consequence, more water being required than in an ordinary public house. The matter came before the King's Bench Division on appeal from the County Court decision that the water supply for lunch purposes was not a domestic supply; and the King's Bench Division allowed the appeal, holding that the water used in the catering business was supplied for domestic purposes, the test being the user to which the water was put. A further appeal was made to the Appeal Court, and the decision of the Divisional Court was upheld. *Appeal dismissed.*

III. INDUSTRIAL DISEASES AND TOXICOLOGY.

Diachylon and Plumbism.

Miscarriages amongst white-lead workers are common. Female labour should, therefore, be abolished in the dangerous processes of white-lead manufacture. Another source of plumbism amongst women is the use of diachylon-plaster pills for the purpose of procuring abortion—at least amongst women in the Pottery Districts. Much acute and protracted illness, and even death, may result from the practice. Lead is a powerful ecbolic, probably acting upon the unstriped muscle-fibres of the uterus. The sale of diachylon should be prohibited.

Miners' Nystagmus.

Miners' nystagmus causes a loss to the State of about £100,000 per annum, and great suffering to the miners afflicted. The disease was placed upon the Schedule of the Workmen's Compensation (1906) Act in 1907. Defective illumination of mines is to blame, though, doubtless, errors of refraction, want of muscle balance (weakness of internal rectus), and a neuropathic diathesis may contribute also. Defective illumination of mines is the chief cause, and not, as was formerly held the, cramped position in which some miners have to work and the consequent eye-strain. Mines lighted by safety lamps are specially bad, whilst lines lighted by candles are, more or less, exempt from the disease amongst the workers. It is only in coal mines that the disease occurs, metalliferous mines, for instance, being exempt, although the hours of work are as long and the cramped positions as common as in the former. The real nystagmus is the oscillation of the eyes, but other concomitant symptoms are twitching of eyelids, nodding of head, tremor of hands, etc. The oscillation of the eyes may be rotatory in one, vertical in the other, or vertical in one and horizontal in the other, whilst the most general neurotic symptoms, outside the nystagmus, may be grouped together as a complex neurosis, generally ending finally in the nystagmus.

Occupational Brass-poisoning: Brass-founders' Ague.

Brass is an alloy composed of copper and zinc. Fine brass or red brass contains two parts of copper and one part of zinc, but many other qualities exist, containing different proportions of the two metals. Bronze is an alloy consisting of copper and tin, generally nine parts of copper to one part of tin, but, in the trade, fine brass or red brass is often called bronze. Other metals are often incorporated, e.g., lead, aluminium, phosphorus, antimony, and nickel. Brass poisoning is due to the inhalation of fumes arising from molten brass within the brass foundry. "Brass itch" is known amongst brass polishers, and is due to the slight irritation of brass dust, combined with habits of uncleanliness. There is no peculiar poisoning due to trauma from brass or other industrial exposure to brass dust, as amongst polishers; but a greenish discoloration of the skin, hair, gums, etc., may occur, due to the copper constituent entirely.

"Brass-founders' ague" is an acute malaria-like syndrome of chill, fever sometimes, and sweat, due to inhalation of vapour or fumes arising from molten brass or from the fumes of pure zinc alone. Prostration follows, ending in sleep. The attack lasts five to twenty hours, with small and rapid pulse (120 to 130 per minute). Respiratory diseases (bronchitis and phthisis) are common, as are also chronic dyspepsia, biliary trouble, constipation, hæmorrhoids, pyorrhœa alveolaris, anæmia, and emaciation. It may be due to acute copper-poisoning, zinc-intoxication, or other metallic or other poisoning due to the contaminating metals and impurities encountered in the process of manufacturing brass. The *preventive measures* are: (1) Proper hygienic surroundings in foundries and smelters; (2) Regulation of workmen's habits; (3) Hoods and stacks to furnaces and furnace areas; and (4) Ventilation generally.

Phthisis in Derbyshire Quarries.

Derbyshire, as a county, has three different forms of quarrying, and a large agricultural area, and the incidence of pulmonary tuberculosis (phthisis) in these various districts is interesting, as shown by a Report just published (1913). The highest rate is in the millstone-grit quarries, the grit containing 96 per cent of silica, which may be in very fine subdivision as dust. This silica dust is insoluble, and remains fixed in the mucous membrane of the bronchial tubes, leading to irritation, thickening, and abrasion, the last mentioned forming an entrance for the tubercle bacillus. The death-rate amongst the millstone-grit miners is ten times as great as that amongst the limestone miners, and twenty times as great as that amongst the agricultural dwellers in the same area. It is probable that the so-called "grinders rot " in large towns is due to the particles of gritstone, rather than of the metal which is being ground.

The death-rate from phthisis is higher amongst lime-quarrymen than amongst coal-miners, the particles of carbon in the latter case acting as disinfectants. The *preventive measures* that suggest themselves, such as the wearing of respirators, bathing and washing, etc. are difficult to enforce locally, long-established custom being hard to break down.

SPECIAL ILLNESS AMONGST WEAVERS OF COTTON CLOTH.

A Report has been issued during 1913 by the Home Office, dealing with an unusual form and amount of illness amongst weavers of cotton cloth at Colne and Burnley. The symptoms were feeling of tightness across the chest, rapid breathing, persistent irritating cough, expectoration of a thick yellow or yellowish-green sputum, sweetish taste in the mouth, etc.—ending in asthma symptoms, epistaxis (at times), and insomnia; with general malaise, aching limbs and back, severe frontal headache, and fever. Loss of weight ensues. The cause given in the Report is mildew (unusual form) developing on the cotton threads following the process technically known as " taping " or " tape-sizing " with a preparation principally composed of flour (derived from wheat, sago, or potatoes), tallow, china, clay, and water. As a preventive, formaldehyde as an antiseptic is recommended in place of the usual antiseptic employed in other processes of the trade, viz., chlorides, which are specially forbidden to be used by the dyers who purchase the particular goods under investigation. The illness is fortunately very rare.

WORKERS AND INDUSTRIAL ANTHRAX INFECTION.

During 1913 a Committee was appointed by the Home Secretary to inquire into the dangers from infection by anthrax in the processes of sorting, willeying, washing, combing and carding wool, goats' hair, and camels' hair, and in the processes incidental thereto; and to consider and report whether any, and, if so, what, amendments are desirable in the Regulations for these processes made under s. 79 of the Factories and Workshops Act, 1901. The Right Hon. Sir Thomas P. Whittaker, M.P., is Chairman, and Mr. G. E. Duckering (one of H.M. Inspectors of Factories), Secretary to the Committee. The address of the Secretary is 72, Bridge Street, Manchester.

WORKERS AND MANGANESE TOXICOSIS.

Prof. von Jaksch, of Prague University, has placed on record, during 1913, the symptoms due to manganese poisoning or toxicosis, which is met with amongst workers in potassium permanganate, in manganese mills, and in mines containing ores rich in manganous acid. The symptoms are: convulsive laughter, weeping, and mental alterations, followed by retropulsion and what may be called pseudo-Romberg symptoms, spastic gait, increased tendon reflexes, increased salivation, mask-like expression of face, and monotonous voice. Prognosis as to life is good, as to recovery bad; and treatment consists of cold-water cures, physical exercises, use of walking-chair and electricity. Experiments with dogs breathing in manganese dust proved negative.

THE EDITOR'S TABLE.

Samples and particulars for this section should be sent to The Editor, "Medical Annual" Offices, Stonebridge, Bristol, **before November 15th.** ***It is much to the interest of manufacturers to observe this rule.***

NEW PHARMACEUTICAL PRODUCTS & DIETETIC ARTICLES.

We are always ready, when a sufficient quantity is sent to us *early in the year*, to arrange for them to be tested in hospital practice and reported upon: under other circumstances our knowledge is necessarily more limited; but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires.

NEW MEDICAL INSTRUMENTS AND APPLIANCES.

We give Inventors and Manufacturers the opportunity of bringing their work before our readers entirely free of cost to themselves, and subject only to the following simple conditions:—

(1) Each article sent for notice must have the novelty or improvement claimed for it clearly stated upon a *separate* sheet or sheets of paper. This should have attached to it a copy of any illustration (*which must be small*) for which insertion is desired, and also bear the name of the firm.

The attention of Firms who send a large number of articles for notice is particularly directed to the above condition, as each article has to be sorted into its proper department before it can be considered.

(2) Medical Inventors should merely describe the instrument or appliance, and avoid giving technique of operations.

The Editor is not able to accept reference to circulars, catalogues, or **literature as a compliance with these conditions.**

We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the MEDICAL ANNUAL has come to be valued.

MEDICAL AND SURGICAL APPLIANCES

Aseptic Instruments. Considerable attention has been given during the past year to the newer and better method of keeping surgical instruments not only aseptic, but always ready for immediate use. The system of sterilizing by boiling is not only tedious, but damaging to the instruments. Tentative efforts were made by keeping instruments in alcohol, but it is obvious that the solution used should be non-evaporating and also a reliable antiseptic. With the discovery that an aqueous solution of Brytstele, which is a more powerful antiseptic than carbolic acid, would not only prevent instruments rusting, but preserve the lustre of the steel indefinitely, the way has been made easy, and the surgical instrument manufacturers have not been slow to afford us the means of keeping our instruments in this way.

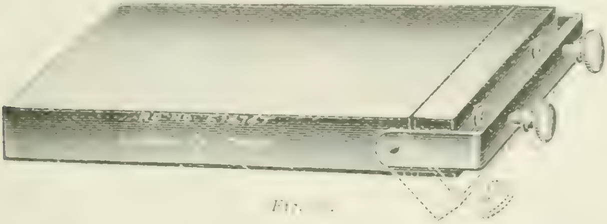

Fig. [illegible].

For a set of instruments, such as would be carried in the ordinary pocket case, we have the *Holborn Aseptic Pocket Case* (*Fig.* 83), designed by Mr. H. Simmons, of Bournemouth, and made by the Holborn Surgical Instrument Co. Ltd. This contains a pair of scissors, two pairs of artery forceps, a double pocket knife, probe, dressing forceps, and metal box with needles and sutures, and costs 35/-.

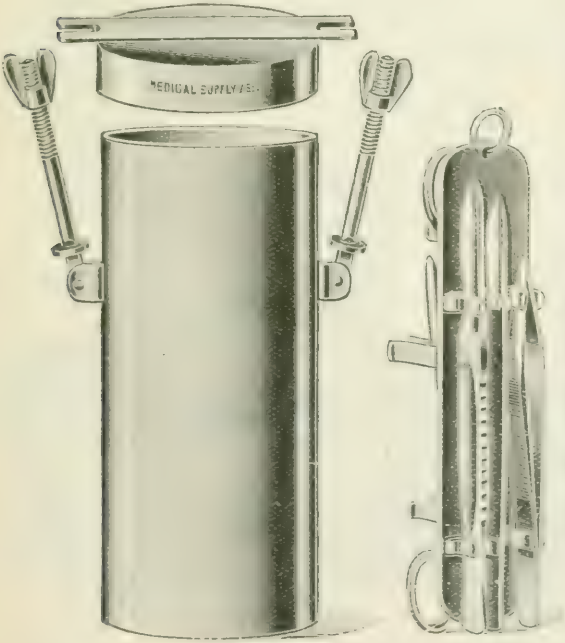

Fig. [illegible].

Another appliance of this kind is *Landon's Surgical Case*, produced by the Medical Supply Association, 167-173, Gray's Inn Road, W.C. It holds 2 scalpels, 6 pairs of artery forceps or scissors, and sponge forceps, and costs 30/-. This, as will be seen from *Fig.* 84, is more suitable for the surgical bag. The same firm also supply a glass tube with wire rack for holding a single scalpel immersed in [illegible] solution, for which they are the agents.

Messrs. Philip Harris & Co., of Birmingham, also have a *Scalpel Carrier* (Fig. [illegible]). This is an ingenious method of carrying a scalpel so that it can

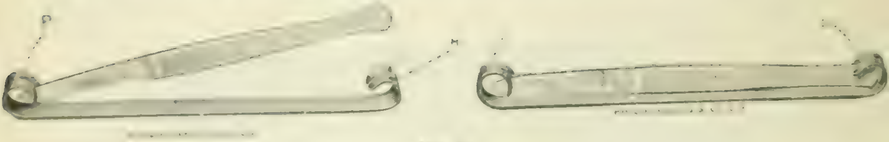

Fig. [illegible].

be immersed in a test-tube and have its point protected, or any number can be immersed in a wide-mouthed bottle of suitable size. Price 1/-.

The same firm have produced the most perfect *Pocket Surgical Case* (Fig. [illegible]) for instruments immersed in solution that has at present been brought under our notice. It is simple and compact, and is hermetically sealed by a screw passing through its whole length and which fixes the lid. The dimensions of the case are 6½ by [illegible] by [illegible] inches. It contains a rack by which all the instruments can be lifted out at once, and it will be seen that they are sufficient to meet any ordinary emergency. It contains 1 finger knife, 1 scalpel, 1 pair Spencer Wells' artery forceps, 1 spring dressing forceps, 1 pair scissors, 1 [illegible] needleholder, 1 perforated metal box containing 3 assorted spring-eyed suture needles, 1 bottle ligature silk in alcohol, with metal screw cap, 1 sharp hook, 1 double sharp Volkmann's spoon, 1 probe, 1 director with scoop, 1 record hypodermic syringe and 2 needles.

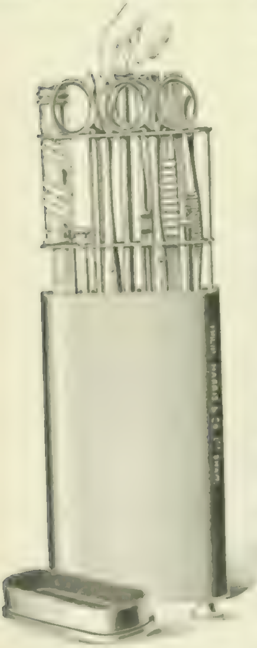

Fig. [illegible].

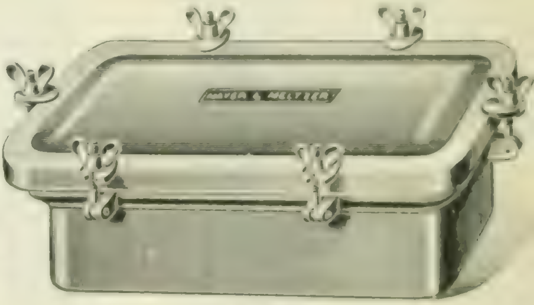

Fig. [illegible].

To meet the requirements of major operations, Mr. W. Sampson Handley has designed a Larger Instrument Case, which is here illustrated (Fig. [illegible]). It is 9½ by [illegible] by [illegible] inches. It can, of course, be made in larger dimensions if desired. This case is adapted for boiling over a spirit lamp if required. It is made by Messrs. Mayer & Meltzer, [illegible] Great Portland Street, W.

Mr. [illegible] has also designed an *Instrument Sterilizer* more suited for major operations which can be used either for sterilizing over a gas fire or simply carrying the instruments immersed in solution. We illustrate this (*Fig.* 88). It is made by Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.

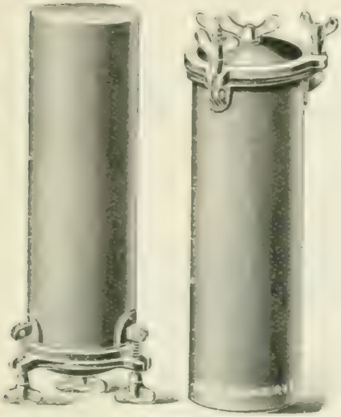
Fig. 88.

A *Container* (*Fig.* 89) for holding a hypodermic syringe in Brytstele solution is sent us by the Medical Supply Association, 167 - 173, Gray's Inn Rd., W.C. It is made in either all-metal (4/-), or metal frame with glass container (4/6).

Fig. 89.

Bacteriological Bench.—The " Hystos " Bench (*Fig.* 90) has been specially designed for the use of general practitioners and others who require an inexpensive and portable bench. It is so arranged that the necessary connection for water, gas, and electricity can be easily made. A water pump can be fitted for Pasteur filters, etc. It is strongly made of pitch pine, with mahogany or teak top, by Reynolds & Branson Ltd., Leeds. Price £6 15s.

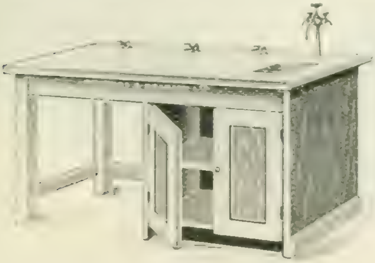
Fig. 90.

Bandage Winder.—A new form of this appliance (*Fig.* 91) has been introduced which automatically winds the bandage after the handle has been turned a few times. It thus leaves both hands free to manipulate the bandage. It is much more rapid in its action than the ordinary winder. It costs 21/-, from Messrs. Philip Harris & Co. Ltd., Birmingham.

Bandages.—The advantages of the bandages illustrated below (*Fig.* 92) are that they are easily fixed neatly and securely in position by means of the adhesive plaster at the end, and no safety pins or

Fig. 91.

tying are required. They are supplied in various sizes for the finger, arm or foot, at very reasonable prices, by the Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

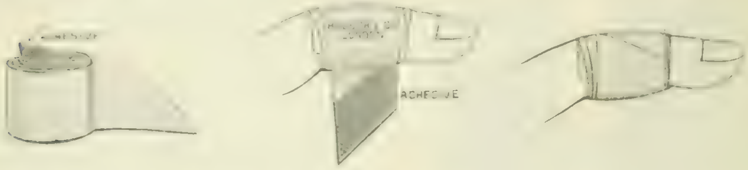

Fig. 92.

Cabinet (Combination).—*Fig.* 93, shows a most convenient arrangement for hospital ward or surgery, as it combines in one appliance most ordinary requirements—a cabinet for instruments, dressing table, 8 boxes of lint, wool, gauze, bandage, etc., swing bowl and tray, sliding shelf underneath and bin for soiled dressings. The whole is mounted on large rubber-tyred casters, the total height being 63 inches. Supplied at £6 6s. by the Surgical Manufacturing Co., 85, Mortimer Street, W.

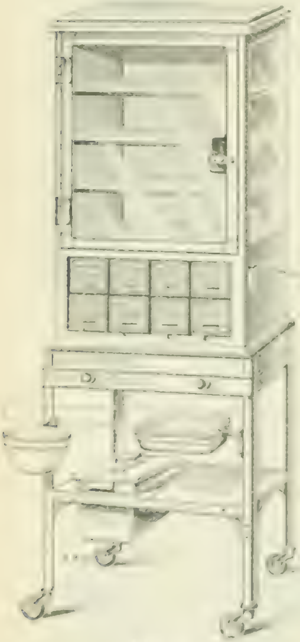

Fig. 93.

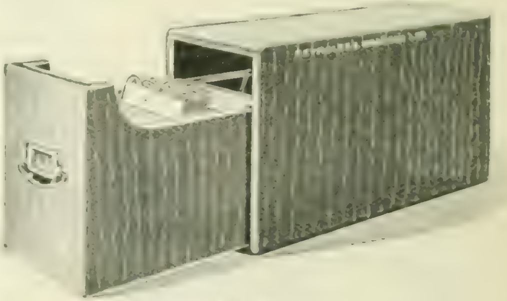

Fig. 94.

Cabinet for Ledger Cards.—In connection with Messrs. Reynolds & Branson's system of cards instead of ledgers, they supply cabinets (*Fig.* 94) for filing the ledger cards, which permit of quick and easy reference. These can be fitted with alphabetical index cards of various [illegible] of 25, 50's or 100's, also numerically, monthly and days of week. They are strongly made in mahogany or oak, and have three movable aluminium partitions to keep the cards upright. Price 15/-. We think this method will prove very convenient. We have used a similar system instead of a case-book for many years, and find it far better, as notes and correspondence can be filed with the cards.

Catheter (Ureteric, Silk Web).—This is graduated in half-inches, alternately transparent and opaque to the x-rays, half-inch divisions, as designed by Mr. Thomson Walker. Bougies are also made with silver-woven spiral covered with red elastic gum, opaque to the x-rays, graduated to show each half-inch. Both are also graduated specially to indicate each length of 6 inches (Fig. 95). Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.

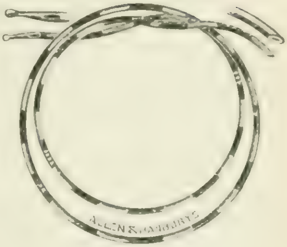

Fig. 95.

Chair, The "Grevillite" Folding.—This is a marvellous piece of construction: the production of a comfortable arm-chair with velvet cushions, a very efficient leg-rest, so that it will pack flat into a space 4 inches deep and yet be quite rigid and durable in use, has required much mechanical skill. (*Fig.* 96). It is comfortable to sit in, and has an attachment which can be used either as a side-table or book-rest. The leg-rest packs away under the seat when not in use. Considering that the chair, upholstered in velvet, only costs 28/6, and in striped canvas 15/6, and the leg-rest and extra table another 6/– or 7/–, we think it should have a very large sale. We recommend it with great confidence. Supplied by the Medical Supply Association, Gray's Inn Road, W.C.

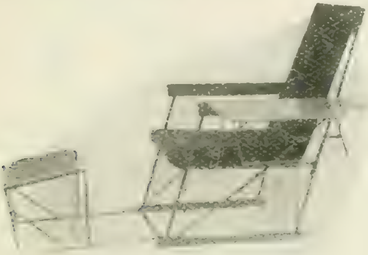

Fig. 96.

Clamps.—The *Intestinal Crushing Clamp* here illustrated (*Fig.* 97) is one which has been especially made for Mr. W. Ernest Miles, F.R.C.S., by the Holborn Surgical Instrument Co., for use during the radical abdomino-perineal operation for cancer of the rectum. The proximal half of the blade is nearly an inch in breadth, in order that the crushed part of the pelvic colon shall be sufficiently wide to permit of easy division between the ligatures. The distal portion of the blade is much narrower, as it is only necessary to crush the mesocolon, for hæmostatic purposes, along the line of division. The advantage of using this clamp is that it greatly minimizes the risk of infection when the pelvic colon is divided.

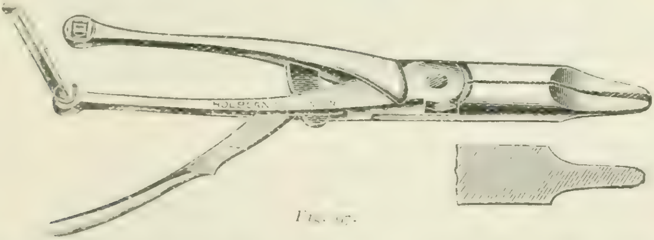

Fig. 97.

Vaginal Clamp.—The accompanying illustration (*Fig.* 98) shows a clamp for the vagina in cases of Wertheim's hysterectomy, designed by Mr J. Basil Hall, F.R.C.S. It is applied as follows. When the uterus

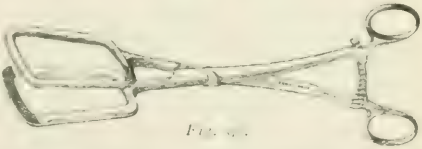

Fig. 98.

is isolated from all its attachments, and the vagina is freely exposed, the jaws of the clamp are opened and passed over the fundus uteri. The uterus is then slipped through the fenestration of one of the jaws (preferably the anterior), and the clamp is pushed down until the transverse limbs of the jaws lie across the upper end of the vagina, when the clamp is closed. All septic discharge is thereby shut off from the operation field, and at the same time the instrument can be used as an efficient tractor, and any slipping is impossible. The width of the jaws at the widest point is 3 inches, which allows plenty of room for manipulations in the pelvis. The instrument can be used for any case except one in which a large fibroid co-exists with malignant disease, when the fibroid must first be enucleated. Made by Down Bros., Ltd.

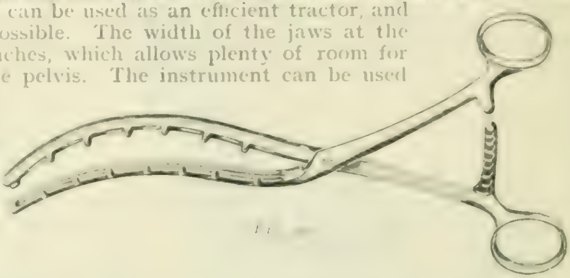
Fig. 99.

Fig. 99 illustrates the latest pattern of the *Clamps* made for Kocher, of Berne. The blunt knobs prevent slipping. There are three sizes curved as illustrated, and two sizes straight. The Holborn Surgical Instrument Co.

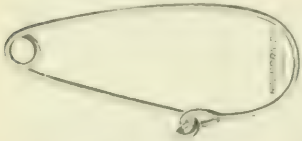
Fig. 100.

Clip (Wire).—These clips (*Fig.* 100) are very strongly made, and are useful for keeping artery forceps, etc., together during sterilization. They cost 7/6 per dozen, and are made by the Holborn Surgical Instrument Co., Ltd.

Curette Sharpener.—This is made of Arkansas stone in the form of a pencil mounted in nickel-plated reversing case. It is suitable for sharpening post-nasal curettes and other similar instruments with inner cutting surfaces. It may be also used like an ordinary "steel" for putting an edge on a scalpel. It is quite a useful addition to the surgical case, and is supplied by the Medical Supply Association, Gray's Inn Road, W.C.

Douche Tube (Vaginal).—This is a vaginal douche tube with rubber shield. Very hot injections may be used without scalding. The rubber-covered terminal forms a plug to the vagina, so that the hot water is retained in longer contact with the passage, and then flows back through the outlet without escaping at the sides of the nozzle. It is very practicable and novel, and may be obtained from the Medical Supply Association.

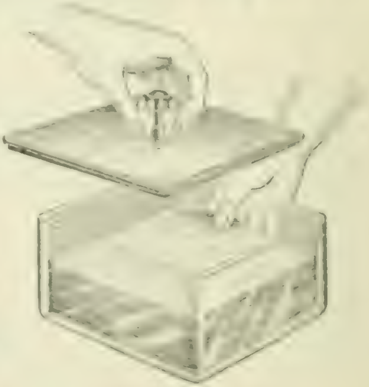
Fig. 101.

Dressing Boxes (Glass).—The new "[illegible]" glass dressing box has an improved glass lid (*Fig.* 101). The lid is fitted with a polished glass knob united by a nickel-plated metal union. In case of breakage, new lids can be replaced at a reasonable cost, and any size supplied to order, as it is only necessary to cut the plate glass to fit the box and cement the glass knob. We find these boxes excellent for storing surgical instruments in antiseptic solution. They only need for this purpose a tray of perforated zinc, for lifting-out purposes. The Medical Supply Association.

Electrophone (The "Groos.") This claims to be more perfect than similar instruments for aiding deafness, because it bears fine adjustment to meet varied conditions. It is the absence of this power in the earlier instruments which caused their failure in so many cases. It is well worthy of a trial, and we understand that the makers will permit this before purchase. The price complete is £2 2s, from the Medical Supply Association.

Ether Apparatus. The principle of the intratracheal administration of ether is now well known. Warm, moist, and etherized air is supplied to the patient at the bifurcation of the trachea by means of a catheter passed through the glottis. The air is under pressure, and as the catheter is only half the size of the glottis, the excess of air escapes easily between the catheter and the glottis. It remains, however, under sufficient pressure to expand the lungs, and being constantly renewed, suffices for respiration. Though primarily designed for the performance of surgical operations on the thorax, it possesses further advantages in general surgery. (1) By its means thoracic surgery is rendered possible without resorting to the cumbersome and costly positive and negative cabinets. (2) In mouth, nose, and throat operations there is no danger of the inspiration of blood, mucus, or pus. (3) In goitre operations air is supplied below the tracheal obstruction. (4) In head and neck operations the anaesthetist is well out of the way of the surgeon. (5) It renders easy, from the slight respiratory movements, operations on the upper part of the abdomen; and (6) It is a most efficient artificial respiratory apparatus. It consists of two parts: one for the production of the current of air which is obtained by an electric motor or a foot-bellows; the other, the ether apparatus (*Fig.* 102), which warms, moistens, and etherises the current of air. It is designed by Mr. R. E. Kelly, F.R.C.S., of Liverpool. Down Bros. Ltd., St. Thomas's Street, S.E.

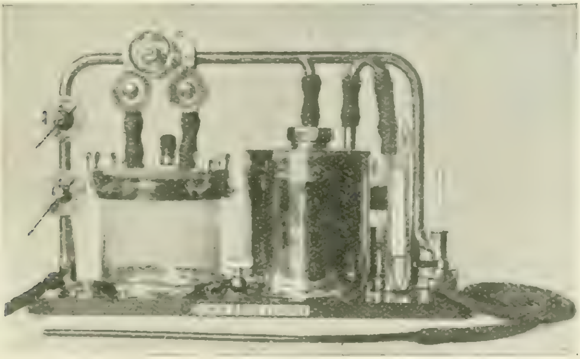

Fig. 102.

The ether apparatus illustrated on next page (*Fig* 103) has been devised by Mr. G. E. Gask and Mr. H. E. G. Boyle for the intratracheal insufflation of ether. Air is driven from the bellows A, through hot water in the bottle C (the tap B is for air and B1 is a reserve tap for oxygen if necessary). The air then passes through E, over the surface of the ether in the smaller bottle, and so on to the gum-elastic catheter. When it is desirable to give air without ether, E E are turned off and G is turned on. By regulating these taps it is quite easy to have either the whole or part of the air laden with ether vapour. The manometer D registers the pressure under which the air is driven into the trachea. The apparatus and the method of maintaining

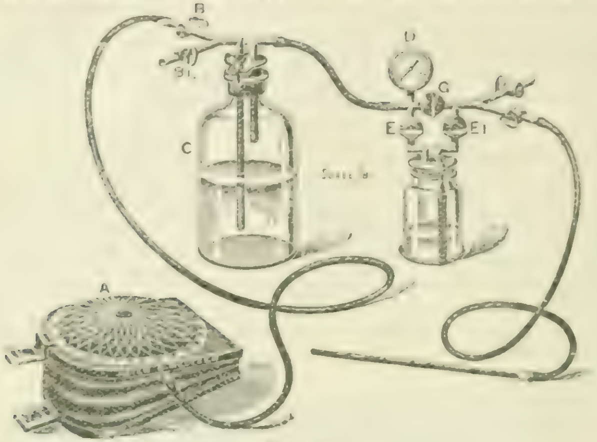

Fig. 103.

anæsthesia, are mainly intended for intrathoracic operations. (Mayer & Meltzer, 71 Great Portland Street, W.)

Ether Can.—This can, devised by Dr. W. J. McCardie of Birmingham, is made of thin metal, which quickly takes up heat from the hand; it is inexpensive and unbreakable. It has no neck, and therefore there is no waste of neck space, which is a drawback to glass bottles. The nozzle is simple in form and covered with two screw-caps. Being ether-tight, the can may be carried in any position in the surgeon's bag. Any form of dropper can be easily fitted. It holds 11 oz. and costs 3/6 (*Fig.* 104). Mayer & Meltzer.

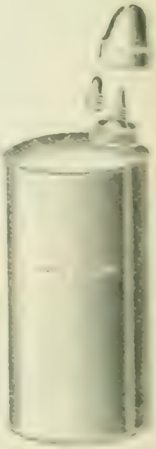

Fig. 104.

Ether Inhaler.—[illegible] the glass jar is half filled with ether, and is connected by the rubber tube to the two-way valve and face-piece (*Fig.* 105). The valve [illegible] is then adjusted so that its lower end just touches the surface of the ether, and the extra air-inlet F is opened wide. The face-piece is now adjusted, and the patient directed to breathe quietly. While the extra air-inlet F is open no air should pass through the ether receiver, but as the sleeve [illegible] is slowly and steadily revolved to gradually close the extra air-inlet F, the patient begins to inhale through the ether receiver. The closing of the inlet [illegible] should be completed in about four minutes, and the tube [illegible] should then be gradually immersed to the depth of about one inch, the whole induction period taking about eight minutes. When the stage of surgical anæsthesia has been reached, the tube B may be gradually raised until the depth necessary to maintain anæsthesia has been determined. Suggested by Mr. L. T. Rutherford, of Exeter, and made by Down Bros. Ltd.

Ether Mask.—This inhaler (*Fig.* 106) is of the Schimmelbusch pattern, with a raised inner wall. It was devised by Dr. L. Ernest Acomb, of Newport (Mon.). It obviates any danger of ether being dropped upon the face of the patient; and, as the respiratory space is to a certain extent limited, saturation with ether can be more readily obtained. Thus anæsthesia can be more rapidly produced and more easily controlled. Mayer & Meltzer.

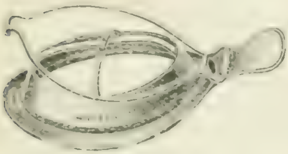
Fig. 106.

Eyes (Artificial). It is claimed for the "Eukoric" artificial eye (*Fig.* 107) that when in shadow the outline of the pupil becomes indistinct and the pupil appears enlarged, but in bright light the pupil is small and the outline distinct. Supplied by Messrs. Mayer & Meltzer, who have also produced an artificial eye extractor, for removing the eye without injury to the socket.

Fig. 107.

Eye Douche.—This is an excellent arrangement for giving continuous irrigation to the eye. An eye-cap, furnished with an inlet for the supply of the irrigating fluid, and an outlet to which an india-rubber tube is attached for carrying off the fluid, is supplied in conjunction with a graduated tube for holding the solution. By this means the eye can be irrigated with the medicated fluid more efficiently than with any other appliance that has come under our notice, and we can confidently recommend it. The cost is only 3/-. Ferris & Co. Ltd., Bristol.

Eye Instruments.—Messrs. R. Sumner & Co., Lord Street, Liverpool, send us a small set of eye instruments (*Fig.* 108), arranged so as to be carried in an ordinary pocket case. It consists of a scoop, gouge, spud, spear-pointed needle, and a magnet, all of which are carried in the handle, and can be fixed at the end when required for use. They are found to be very useful for practitioners in manufacturing, iron, or colliery districts, where they are frequently called upon to remove foreign bodies from the eye. Price 12/6.

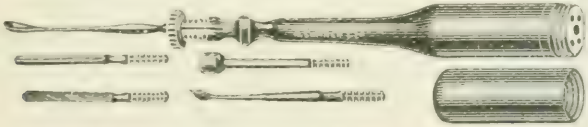
Fig. 108.

Forceps. *[illegible] Straight Suturing Forceps* is as ingenious as it is convenient, enabling wounds to be sutured without assistance. The principle is to combine two forceps in the one instrument, as shown in the illustration (*Fig.* 109). First one side of the wound is grasped with two of the blades, then the other side by the remaining blade, and the opposite sides are therefore brought perfectly together and can be easily stitched. This does away with two forceps, and is an exceedingly simple procedure. We do not think any surgeon who has once seen these forceps would be without them. Price 8/6.

Hertzka's Curved Suturing Forceps acts in a similar manner. This instrument is used to close large open wounds in order to draw the edges together and allow easy tying of the silk sutures. Before use both slides are opened. The forceps are taken into the right hand in such a way that the thumb rests as usual on the slide. . The slide nearest to the wound edge is closed by the thumb. The pressure of the finger is moderated, and the other two blades open, and are used to grip the other edge of wound, whereupon the peculiar slide is closed by means of the middle finger. Price 12/6.

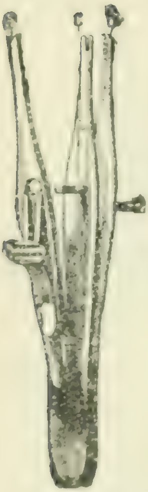

Fig. 109.

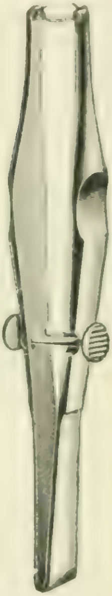

Fig. 110.

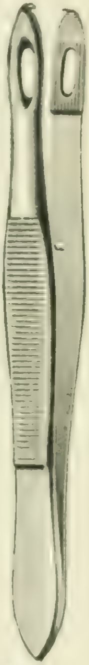

Fig. 111.

We also illustrate *Hertzka's Forceps for clamping Michel's Sutures* (*Fig.* 110). This forceps is fitted with two finger-rests for opening it to pick up the sutures, which are then ready for use.

Another very useful forceps is *Hertzka's Suture Threading Forceps* (*Fig.* 111) for threading split-eyed needles. All four instruments come from the Medical Supply Association, 167-173, Gray's Inn Road, W.C.

Fracture Instrument. Mr. G. H. Colt, F.R.C.S., has designed the instrument shown in Fig. 112 to overcome the difficulty sometimes experienced in reducing the fragments before applying a Lane's plate in cases of fracture of the long bones. This is especially noticeable in old-standing cases of fracture of the middle of the shaft of the femur. Much of the force used is applied through the knee-joint, and may cause synovitis. The maintenance of extension is excessively tiring to the assistants. The instrument is used as follows: Extension is carried out in the usual manner, without using undue force, and then the fragments are seized with two Lane's bone-holding forceps applied parallel to each other and as near together as possible. The slot-pieces on the screw are then adjusted equally from the middle to fit the distance between the forceps, and the instrument is lowered over them so that the slots engage them and the hasps are closed up. The handles of the forceps are held one in each hand by an assistant, and the operator turns the screw until extension has been produced. The plate is then applied. If necessary, coaptation may be maintained by applying a third bone-holding forceps to the fragments, and in this case the instrument may be removed while the plate is applied. Down Bros. Ltd., St Thomas's Street, S.E.

Fumigator ("Gonin"). [illegible] has been sent to us by [illegible] & Co., [illegible] Buildings, Holborn, E.C., who are the British agents for the makers in Paris. It consists of a small canister of "[illegible] Gonin," a white powder containing [illegible] with paraformaldehyde; the lid of the canister is perforated and the perforation sealed with wax, the small canister being enclosed in a [illegible] envelope or paste-board which burns like touch paper. For disinfection of a room, the usual sealing-up of windows and doors is carried out; the paste-board covering is ignited, this melts the wax and opens the hole in the lid, at the same time heating the powder contained within the canister and vaporizing the paraformaldehyde. These contrivances are sold in boxes containing three cones of different sizes; and for those who cling to the belief that it is possible to disinfect a room by any form of germicidal vapour, they may be recommended as economizing trouble and avoiding risk. The outer covering needs a little coaxing to make it burn; the makers warn against the use of kerosene, which makes it burn too fast. Full directions are supplied.

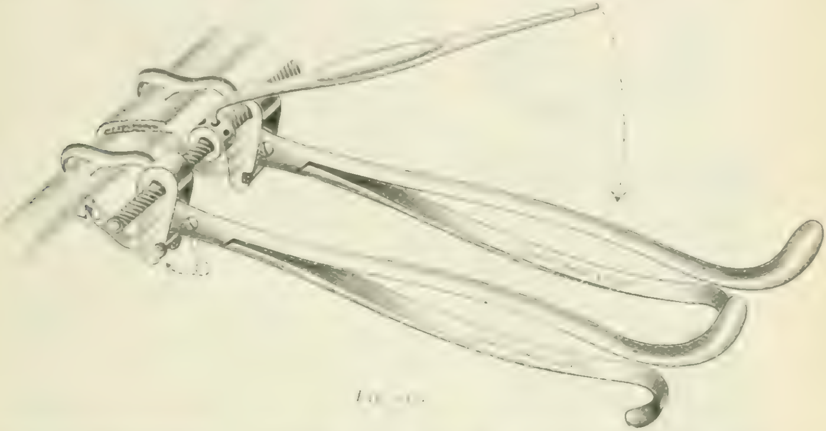

Fig. 112.

Geyser for Surgery (Hot Water).—(*Fig.* 113)—Intended to be fixed over a hand basin, to an ordinary cold-water supply, and heated by gas, so that hot water is available at all times. The cold water enters at the bottom into a narrow cylindrical-shaped container, provided with gills, which radiates the heat from the burner to the walls of the container, thus getting the maximum of temperature given off by the flame. The water can by this means be raised to a temperature of about 160° F., but the output depends upon the temperature at which the water is required. It is entirely constructed of copper, the water- and gas-ways being heavily tinned, and the outer casing nickel-plated, so that it quite harmonizes with the general appearance of surgical appliances. It is a very convenient apparatus, price £3 10s. net. R. Sumner & Co., Lord Street, Liverpool.

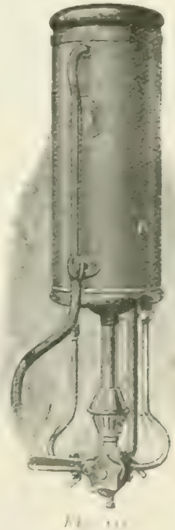

Fig. 113.

Grate (Adjustable).—This appliance can be fixed to an ordinary fire-grate, with the bars removed, with the result that the fire is brought 5 inches further forward and the heat better distributed in the room. When carefully stoked it makes an economic fire, as well as a more efficient source of heat, and it will be a valuable addition to those fire-grates which appear to have been specially designed to allow all the heat to go up the chimney. The cost is small, [illegible] to 12/6, according to size, and they can be quickly adjusted by the purchaser (*Fig.* 114). Adjustable Grate Co., York Road, Ilford.

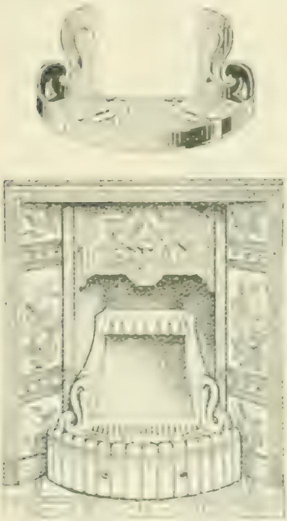

Fig. 114.

Hæmacytometer (Hayem-Sahli). This is a great improvement recently introduced by E. Leitz of 18 Bloomsbury Square, London, in accordance with the suggestions of Professor Sahli. The apparatus is extremely simple in its manipulation, it supplies very reliable readings, and above all does not cause fatigue. With the aid of the tables provided with the apparatus, the number of red or white corpuscles contained in a cubic millimetre of blood can be read off at once. The advantages possessed by this apparatus are sufficiently pronounced to ensure its introduction in hospitals, clinics, and also among general practioners.

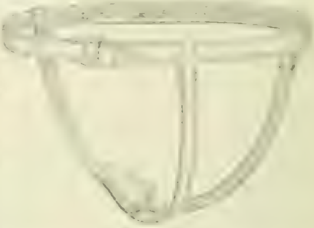

Fig. 115.

Hæmorrhoidal Belt. This simple and inexpensive bandage (*Fig.* 115) supplies a long-felt want to patients suffering from piles, fistula, and any diseases of the rectum. A [illegible] is provided for placing round the waist, at a cost of one shilling, and absorbent pads are supplied for attaching to this at a cost of 3/6 per doz. The arrangement will prove invaluable in a wide number of cases. The Holborn Surgical Instrument Co.

Handle (The "Universal"). A remarkably ingenious handle (*Fig.* 116), to which all kinds of nasal punches, cutting forceps, and

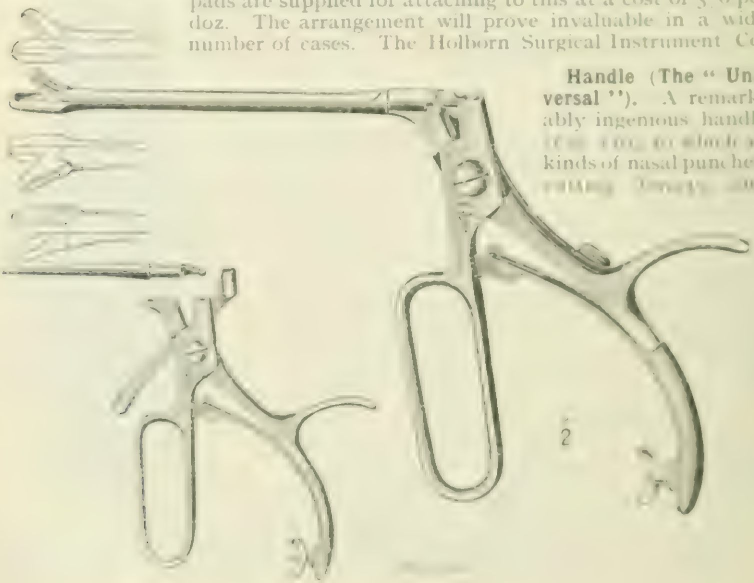

Fig. 116.

scissors, also guillotine, sphenoidal, ethmoidal, and tonsil punches, can be attached. It is very powerful and efficient. Extension pieces are made so that it can be adapted for larynx and œsophagus. At least 50 blades are made, of well-known patterns, to fit the handle, and they can be rotated and fixed in four different positions, so that the instrument can be turned to the right or left, up or down. The mechanical action is perfect, and it gives clean cuts. Cost of handle [illegible]. Blades [illegible] upwards. R. Sumner & Co., Liverpool.

Head Dressing ("Tabloid" Adjustable).—One of the first lessons which the dresser has to learn in hospital is the difficulty of securing dressings on the scalp, a problem which is likely to haunt him in after years. Messrs. Burroughs Wellcome & Co. send out a head bandage in a small watch-pocket parcel which includes a safety pin, a cyanide gauze pad, and full illustrated directions in several languages—a model of neat packing. The bandage consists essentially of a cap, split at one side to make it easy to adjust, with a tail long enough to pass round the forehead and fix the cap in position. We applied it to the editorial head, and found it easy to put on and comfortable as well as secure to wear. A larger size includes a back-piece to cover the nape of the neck, with tapes for securing it. As the makers point out, it may be used not only for dressing injuries but also for covering in the head during operations on the ear, eye, nose and throat, and also for the treatment of scalp infections of various kinds. The cap is washable.

Hypodermic Needles. The Astra seamless steel hypodermic needles are "sprung-in" needles without solder or screw. They are guaranteed not to leak or break in normal use. They are put up in a neat tin box of one dozen, price 3/6, by the Medical Supply Association, Gray's Inn Road, W.C.

Hypodermic Syringes. We illustrate here (*Fig.* 117) an all-glass syringe which has the advantage that the barrel has facets on the exterior, which prevent the instrument rolling when laid down; also that the piston is of coloured glass, which shows up the markings very distinctly on the flat surface of the syringe. Price, in metal case with tube for carrying needles, 5/-. R. Sumner & Co., Lord Street, Liverpool.

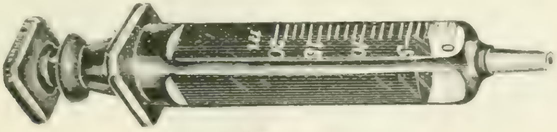

Fig. 117.

Messrs. Burroughs Wellcome & Co. are responsible for an all-glass aseptic syringe for administration of tuberculin, etc. (*Fig.* 118). It is particularly designed for administration of substances which, like tuberculin, have to be given in minute doses. The barrel and piston are elongated to about double the length of the ordinary hypodermic syringe; the former is clearly engraved with numbered graduations of 1 to 10, between which are marked half graduations, each equivalent to ·05 c.c. By this means the required dose can be given with great accuracy. Both piston and nozzle are of deep blue glass, so that the position of the former can be readily determined with considerable precision. The syringe can be taken to pieces easily and boiled. Owing to the clearness with which even ·05 c.c. can be seen in the syringe, dilutions

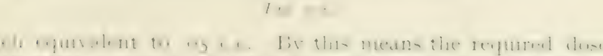

Fig. 118.

can be conveniently used without the need of drawing up the necessary quantity of normal saline solution after the injection. Full directions are supplied with each syringe, which is complete and ready for use.

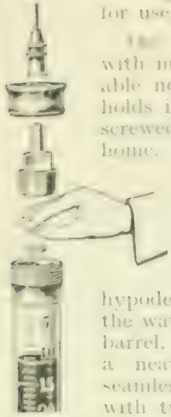

FIG. 119.

The "Ideal" hypodermic syringe (Fig. 119) is made of glass with metallic strength, the chief feature of which is the detachable nozzle held in position by a metal screw rim. The rim holds it absolutely rigid and air-tight, yet when this rim is unscrewed the nozzle is readily loosened by pushing the piston home. The piston is constructed of a solid non-corrodible metal, and fits the barrel with absolute accuracy, thus preventing the fluids from being forced behind it. With all-glass syringes there is a danger of fracturing the nozzle by contact with the piston; with the solid metal nozzle this is obviously impossible. The solution is instantly prepared by the insertion of the uncompressed hypodermic tablet in the water present in the barrel. It is supplied in a neat nickel-plated seamless metal case with two steel needles, for 10/6, by Oppenheimer, Son and Co., Queen Victoria Street, E.C.

A novelty in hypodermic syringes is one of all glass, in which the piston rod forms a receptacle for the needles, as shown in our illustration (*Fig.* 120). It makes a very portable syringe. The Holborn Surgical Instrument Co.

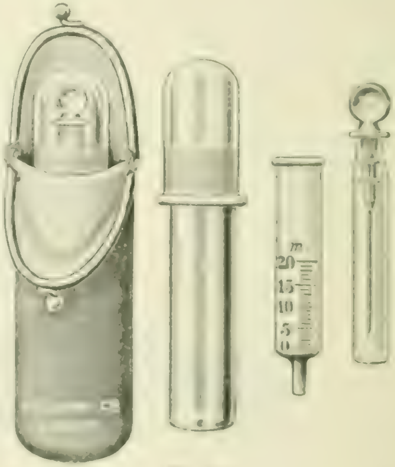

Fig. 120.

We mention the syringe illustrated (*Fig.* 121) because it is claimed to be the cheapest all-glass syringe ever offered to the medical profession. It holds 20 minims, and has two needles, a holder, and aseptic metal case. It costs 1/9, or 18/- per dozen, and is made by the Holborn Surgical Instrument Co.

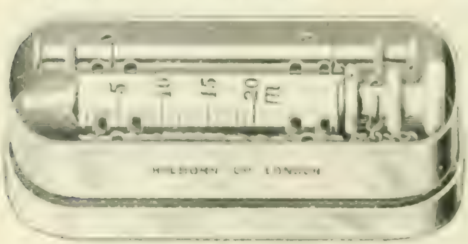

Fig. 121.

The most important development in syringes is the new "All-metal" syringe made by Chas. F. Thackray, of 66–70, Great George St., Leeds. It was designed for surgeons who employ solutions of quinine and urea and novocaine in their operative work, as recommended by Crile in his article on "The Anoci-Association Theory of Shockless Operation" published in the Lancet of July 5th, 1913. It is interesting to note that Dr. Crile himself has found this syringe perfect for his purpose. A special feature is the ingenious way of fixing the needles to the syringe which, while allowing of their easy detachment, absolutely prevents the needle from slipping or allowing leakage. The needles themselves are deeply inserted into the needle mounts, which makes breakage of them an impossibility under ordinary conditions. When filled with solution it is perfectly balanced, and the finger grips, which are made to revolve, provide a means of maintaining the syringe perfectly steady in the hand, even when great pressure is required for injection. It can be plunged into boiling water, for sterilization, without harm, a procedure not possible with metal and glass syringes.

We have carefully tested this syringe, and find the arrangement by which Schimmel's needle can be adapted most perfect. The adapters enable the needles to be inserted either in the straight or right-angled position, and these needles can be supplied of any length and of very fine calibre. We regard it as the most perfect syringe we have yet examined. We understand that smaller sizes are in preparation. The cost of the 30 c.c. syringe complete is only 25

Infusion Apparatus (Souttar's).—This consists of a quart "Thermos" flask, fitted, as shown in *Fig.* 122, with an india-rubber rectal pipe and a Canny Ryall drop-regulator. It has also a water-gauge and three-way tap. By this method the temperature of the water can be maintained for many hours, the fall of temperature being only 1° F. per hour. It is very simple and efficient, costing £2 5s. Allen & Hanburys Ltd., 48, Wigmore Street, W.

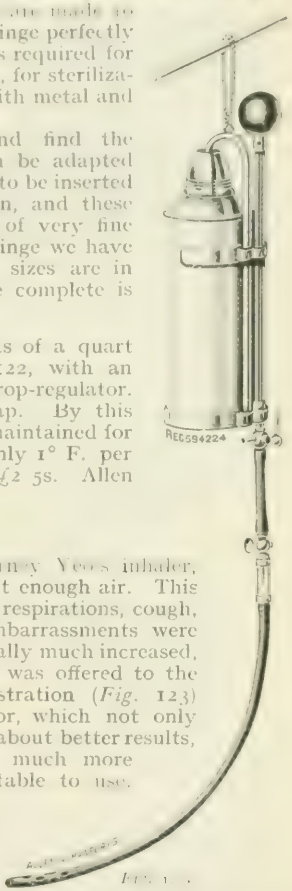

Fig. 122.

Inhalers.

The Harris-Yeo Improved Inhaler.—Dr Burney Yeo's inhaler, which is universally used, is found not to admit enough air. This is especially evident in those cases where rapid respirations, cough, dyspnœa, and the accompanying cardiac embarrassments were prominent features. These symptoms were usually much increased, often dangerously so, by the obstruction which was offered to the respirations by the closed inhaler. The illustration (*Fig.* 123) shows **A** cut away and acting as a ventilator, which not only brings about better results, but is much more comfortable to use.

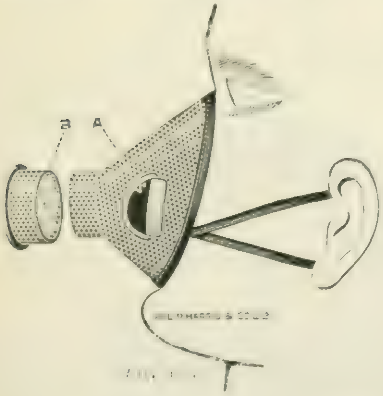

Fig. 123.

The object of this inhaler, of course, is not only to apply the inhalation to the lungs and air-passages so that there will be no obstruction offered to the respirations, but also to allow a free exit of the vitiated expired air, and thus a free entry of pure air on inspiration. The lid **B** takes off to enable the patient to remove it once or twice daily to be cleaned. This cap also prevents the inhalant trickling down the side on to the patient's face. Cost 12/- per dozen. Philip Harris & Co. Ltd., Birmingham.

[illegible] of Aluminium [illegible].—Under the name of the "Pocket Kloram" Mr. Frank A. Rogers, of 327, Oxford Street, W., has improved his

original apparatus so that it now represents the last word in such appliances. A tube shaped like a large cigar, is "charged" with the same freedom. The vapour is obtained from two cartridges placed in the tube, the capsules which they contain being crushed at the moment of doing so. There is no acid to measure nor bottles to keep corked, merely a tube and a supply of cartridges (*Fig.* 124).

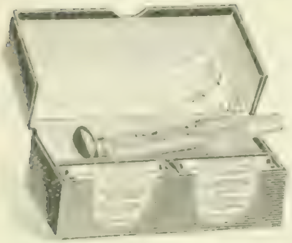
Fig. 124.

Nasal Inhaler.—This holds itself in position on the nose (*Fig.* 125) just as does a pair of pince-nez, in such a way that medicaments are placed upon cotton-wool and held exactly below the nostrils, so that the patient can conveniently inhale for long periods. It is made in three sizes, for men, women, and children. Price 1/6 each. It is a distinctly ingenious and practical invention. The Medical Supply Association, [illegible] Gray's Inn Road, W.C.

Fig. 125.

Invalid Lifter.—We gave a number of illustrations showing Mr. Skiffington's method of lifting patients in bed, in our last issue. *Figs.* 126, 127 illustrate his latest invention for lifting a patient so that the bed-pan can be used without the smallest fatigue or inconvenience. The simplicity of the mechanical arrangement involved will be at once obvious, and we think that every hospital or nursing home should have one or more of these appliances, which solve a chronic difficulty in serious cases.—Mr. A. Skiffington, 96, Church Road, Blackheath, S.E.

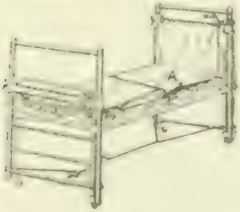

Fig. 126.

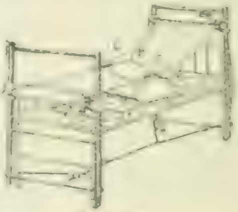
Fig. 127.

Invalid Support.—*Fig.* 128 shows an arrangement designed by Dr. Hamilton Whiteford of Plymouth for keeping a patient in the "Fowler position." It is used in conjunction with an ordinary bed-rest, and the mechanical details will be easily understood from the illustration. Allen & Hanburys Ltd.

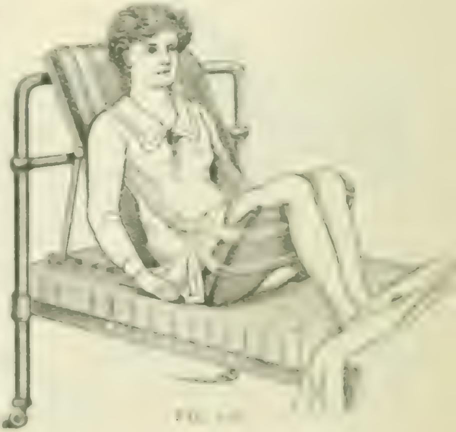
Fig. 128.

Irrigator.—A very simple and practical form of irrigator, and one easily kept sterile (*Fig.* 129). It is made in three sizes, 35, 50 and 100 oz. If broken, a new glass with cover can be had for 2/6, 3/–, and 5/- respectively. A complete 35-oz. apparatus with metal-plated cage costs 5/6. The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.

Irrigator Stand (Canny Ryall's).—Complete with three glass solution reservoirs, with tubing and clips for controlling the flow (*Fig.* 130). It is also fitted with brackets for holding glass box, glass bowl, enamelled iron tray, and drip catcher, these brackets being placed at convenient positions on the standard. An outfit of special double-channel urethral irrigation pipes and a metal vaginal nozzle plugging on to the metal stopcock is provided. Allen & Hanburys Ltd., 48, Wigmore Street, W.

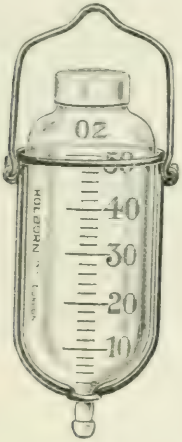

Fig. 129.

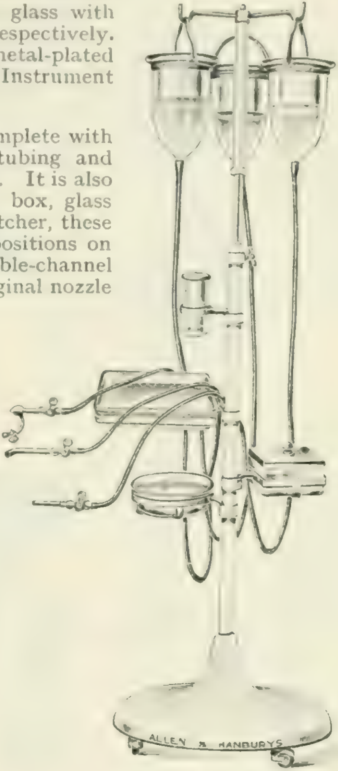

Fig. 130.

Knife (Bruning's Guarded).—This was originally invented by Professor Bruning for ear and nose work, but it has been found very useful for a general guarded knife, which a surgeon can carry about without any danger of injuring the point or the blade (*Fig.* 131). It will answer very satisfactorily for tenotomy, ear, or nose, in fact, any operation where a small knife is required. Allen & Hanburys Ltd., 48, Wigmore Street, W.

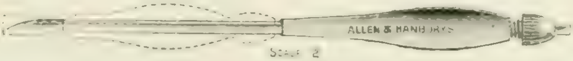

Fig. 131.

Lamp (Head).—An electric head lamp has been sent us by Messrs. Ferris and Co. Ltd., of Bristol. This has a band for the forehead and is enclosed in an aluminium case, which renders it very portable. It is most efficient and only costs 21/–.

Diagnostic Head Lamp.—The diagnostic head lamp which we illustrate here (*Fig.* [illegible]) is well made and remarkably cheap (cost £1 2s. 6d.). Such lamps are very useful and reliable if the practitioner takes care to provide himself with a few spare lamps and an additional battery. Its great convenience is its portability. Philip Harris & Co. Ltd., Birmingham.

The convenience of these lamps when on the visiting round makes them a desirable addition to our resources.

Fig. [illegible].

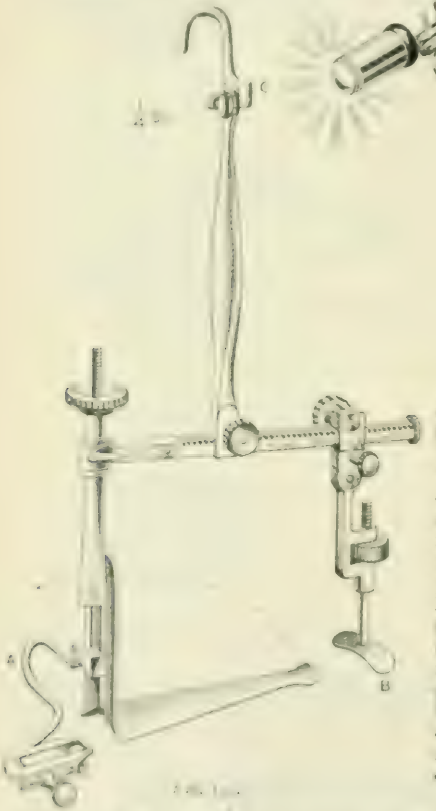

Fig. [illegible].

Laryngoscopic Apparatus.—This apparatus (*Fig.* [illegible]) is a modified form of Killian's, and is suggested by Mr. W. G. Howarth, F.R.C.S. The following are the advantages claimed: (1) The opening **A** is twice as wide, being ½ inch as against ¼ inch. The wider view is especially useful in operations in the deep pharynx and upper aperture of the larynx; (2) The counter-pressor **B** runs on an arm and is adjustable; this has proved of great advantage in the presentation of the anterior commissure; (3) A swivel joint has been inserted at **C**; (4) Small modifications have been made in the size and width of the spatula and in other points. Down Bros. Ltd.

Leg-Cradle.—Mr. H. Richardson Hillman has designed a leg-cradle modified from the ordinary pattern, as the illustration will show (*Fig.* [illegible]). The loops are, on one side, made concave in the lower part of their ordinary convexity, this hollowing-out allowing the uninjured leg to lie comfortably parallel alongside its fellow, and not in a splayed-out condition as is the case with ordinary patterns.

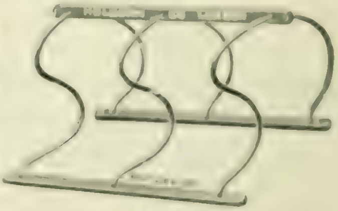

Fig. [illegible].

The advantage is obvious and we can commend the invention. Cost 5/6. The Holborn Surgical Instrument Co.

Ligature Bottle.—A handy little glass bottle with a ground-in lid and no shoulder. It is enclosed in a spiral metal case, which screws down to any depth and firmly secures the stopper. It is made in two sizes at 2/6 and 3/– each. This is both practical and ornamental, and will be found useful for many purposes (*Fig.* 135). The Holborn Surgical Instrument Co.

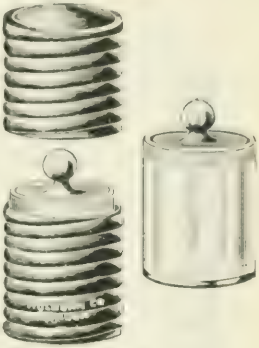

Fig. 135.

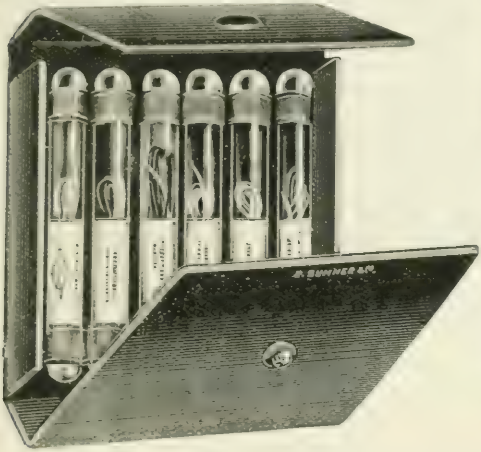

Fig. 136.

Ligatures (Emergency).—This is a neat case containing a selection of ligatures in hermetically-sealed tubes. The selection consists of catgut, silkworm gut, and horsehair, supplied as the purchaser desires. Each tube contains a needle. They are exceptionally handy little cases to carry in a surgeon's pocket, being always ready for immediate use. The case complete with six tubes (*Fig.* 136) costs 5/6, and refills 8d. per tube. R. Sumner & Co. Ltd., Liverpool.

Magnifier (Third Hand).—This ingenious apparatus consists of a magnifying-glass attached to a universal joint, which in turn is fixed to a spring slip (*Fig.* 137). The latter can be placed on the thumb, leaving both hands free. The instrument will be found most useful in removing foreign bodies from the eye, etc. Price, including leather case for lens, 6/–. Reynolds & Branson Ltd., Leeds.

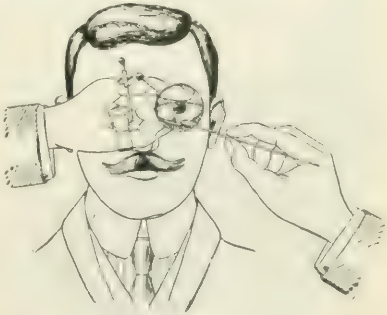

Fig. 137.

Massage Apparatus (The "Poso").—This is an ingenious appliance. It consists of rollers, which are pushed backwards and forwards over the skin. This action revolves a small dynamo, so that an electric current is produced which is greater or less according to the rapidity of movement and whether the skin is dry or damp. For practical use it requires a longer handle than the one supplied. It costs 30/–. The Medical Supply Association, Gray's Inn Road, W.C.

Micrometer Eyepiece (Step). — In this micrometer the intervals are arranged in groups of ten, each group being indicated in an unmistakable manner by a black echelon rising from the first to the tenth interval. This arrangement possesses the great advantage that the divisions can always be seen distinctly, whether the objects be light or comparatively dark. The intervals of the scale (*Fig.* 138), instead of being $\frac{1}{10}$ or $\frac{1}{20}$ mm. wide, as is usually the case in eyepiece micrometers, have a definite value of 0·06 mm. The object of this departure is to obtain for each objective and for a given tube length convenient, and in the majority of cases integral, micrometer values, which greatly facilitates the use of the instrument. The actual tube length differs in most cases but little from the standard length. Each step micrometer is supplied with a table of micrometer constants and corresponding tube lengths computed for the Huyghenian eyepiece No. II and each of the Leitz objectives. (E. Leitz, 18, Bloomsbury Square, W.C.)

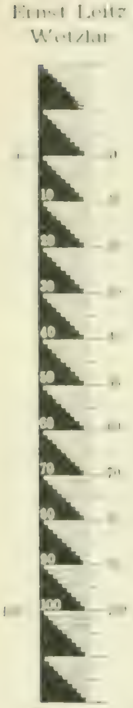

Fig. 138.

Microscope (Double Demonstrating Eyepiece). — By means of an eyepiece which slides into the tube of the microscope (*Fig.* 139), fitted with an arrangement of prisms, the image formed by the objective can be viewed by two persons. Apart from its function as a demonstrating eyepiece, it is a useful adjunct in the instantaneous photography of living bacteria illuminated with the dark-ground condenser. It affords an excellent means of hitting off most propitious moments for taking the photographs. The eyepiece can be adapted to any ordinary microscope. It is made by Mr. E. Leitz, 18, Bloomsbury Square, W.C.

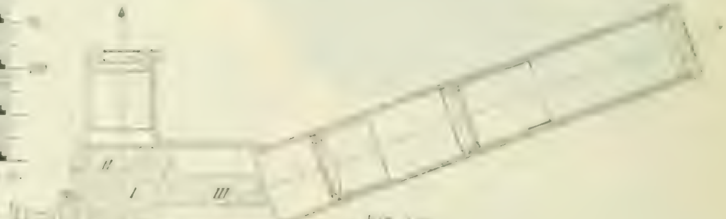

Fig. 139.

Microscopic Slide Tray. — The "[illegible]" microscopic slide tray (*Fig.* 140) consists of three concentric troughs accommodating respectively [illegible], 11, and 17 slides, 35 in all. Immediately after being washed, the slides can be placed almost upright in the trough for drying. The water which drains from them is got rid of through holes pierced for the purpose. There is thus no need for blotting-paper. If the labelled ends are placed uppermost, any slide required can be picked out in a moment. The space within the circles may be used either for the bottle of cedar oil, or for the reception of slides after they have been examined. The tray is made of zinc and is usually kept

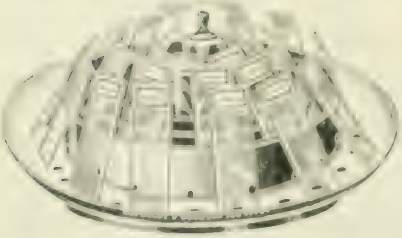

Fig. 140.

clean. It takes up very little room, as it measures only 10 inches in diameter, and is easily carried about from place to place if required. Reynolds & Branson, Leeds.

Micro-Telescope ("Davon" Patent).—By this invention an ordinary microscope can be transformed into a really very wonderful telescope. The principle of the image formed on the retina when looking at an object through a pin hole is the foundation upon which this remarkable invention has been evolved. A good 6-inch telescope objective is inserted into a 6-inch tube, the latter being provided with a carefully and correctly graduated series of "stops" down to the final one of about 2 mm. in diameter. As a result of this the most perfect image of a distant object, free from all halation and image lines, is brought to a focus in the plane of the microscope stage, and in this condition will stand the tremendous magnifying power of the microscope. In other words the microscope as a whole forms the eyepiece of the telescope. Distance does not affect it. A magnification of from 35 to 50 diameters can be obtained from 4 feet away to the planets. When it is realized what this means, the varied uses to which it may be put will be apparent. The habits of insects, birds, etc., can be studied without disturbing them. Jupiter's moons, Saturn's rings, and the craters of the moon have been seen under ordinary telescopic conditions with wonderful distinctness. For medical purposes it forms a fine instrument for examining the skin, for by placing the patient 5 or 6 feet away the whole area under examination can be viewed by a slight movement of the apparatus.

A second attachment of 4-inch focus is also made, and with this in position it is possible to examine a microscopic *area* as distinct from a microscopic speck and *at a distance* of 9 to 12 inches. This short attachment also provides one with the finest compound corneal microscope ever made. The patient is seated so that a light falls upon the eye and the micro-telescope is focused upon it at a distance of about a foot, and the resulting view is surprising. A further and very interesting feature is the ability to do both micro- and tele-photography with it. For this, however, a certain type of microscope is necessary, as the tube containing the eyepiece must be removed so that the camera may take its place. For long-distance photography, both the long and the short focus lenses are inserted in the short tube, and the combination forms the tele-photo lens. We have seen some really fine specimens of both forms of photography, viz., the proboscis of a fly, and a view of shipping taken 3½ miles away. Messrs. F. Davidson & Co. of 29, Great Portland Street, W., are the inventors of this instrument. The cost of addition to an ordinary microscope of the long or short attachment is 30/-.

Nebulizer (Rogers' Pocket).—This was devised specially for use with Rogers' Coryfin Solution, but is equally suitable for nebulizing any other light oily or glycerinated solution; it will also, on the score of its portability and convenience, appeal strongly to the users of asthma solutions, who find the usual form of asthma apparatus cumbersome and objectionable except in private. This little nebulizer is simple and strongly made. The bellows, while not unduly large, has sufficient capacity to supply the necessary force of air, a point which is often overlooked in designing portable instruments of this class. The glass portion is perfectly protected by the neat, strong case provided (*Fig.* 141). Frank A. Rogers, 327, Oxford Street, W.

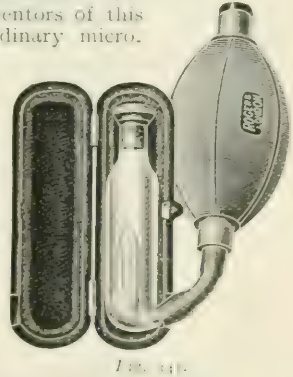

Fig. 141.

Operating-table. This table (*Fig.* 142) has been designed to meet the demand for a cheap apparatus giving perfectly the Trendelenburg and all other movements obtainable in tables, with the additional advantage of raising and lowering. It is easily raised or lowered by slight force exerted on the mechanism, which combines the lever and counterweight principles, and gives a maximum height of 42 inches and minimum height of 34 inches. It can be confidently recommended, and is sold complete with one pair of combined foot and shoulder rests, and one pair of lithotomy stirrups, for £25, by the Medical Supply Association, Gray's Inn Road, W.C.

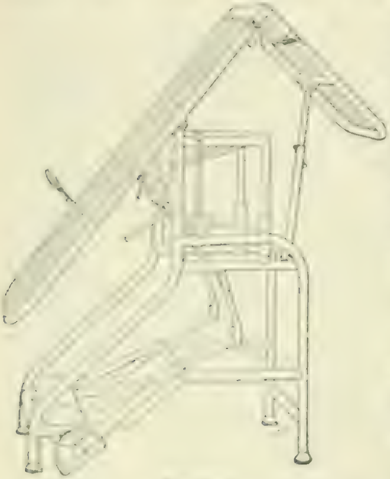

Fig. 142.

Portable Operating Table (*Fig.* 143).—This has been designed for Sir Berkeley Moynihan by C. F. Thackray of Leeds, and has for its main features lightness, and the ease with which the Trendelenburg position can be attained, by simply rotating a right and left handed screw shaft, by means of a handle which in turn works two pairs of pivoted scissor-like arms. This movement is constructed of finest quality steel, although the greater part of the table is made of an alloy of aluminium. The table is very light (actual weight, 34 lb.) and yet stands quite firmly. The head and foot-piece can be fixed at any angle. When folded to fit into a waterproofed canvas case it measures 51 in. in length, 22 in. in breadth, and 4½ in. in depth, and can be obtained complete with stirrups, shoulder-pieces, etc., if so desired. It costs £12 12s., and we can cordially recommend it.

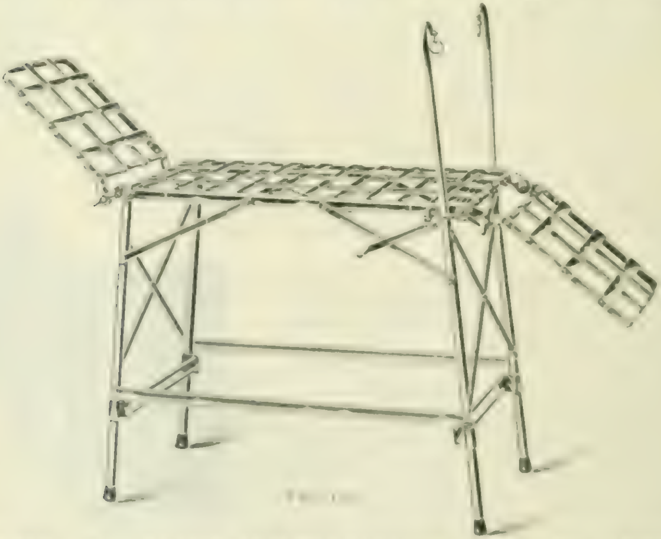

Fig. 143.

Oxygen Bottle. We illustrate in *Fig.* 144 a convenient arrangement by which oxygen can be warmed and medicated with nitrite of amyl or iodide of ethyl before passing to the patient in cases of angina. When it is desired to give a diffusible stimulant, ether may be employed in a similar way, or a quantity of rectified spirit, brandy, or whisky may be poured into the lower part of the flask and oxygen allowed to bubble through it. The bottle may also be used simply to render the oxygen warm and moist. In this latter case the bottle is half filled with hot water and placed in a small basin of hot water, or surrounded by hot wet flannels. In some cases of bronchitis it may be advisable to add to the hot water Friar's balsam, terebene, or other terebinthine preparation. It was suggested by Sir Lauder Brunton, and is made by Allen & Hanburys Ltd., 48, Wigmore Street, W.

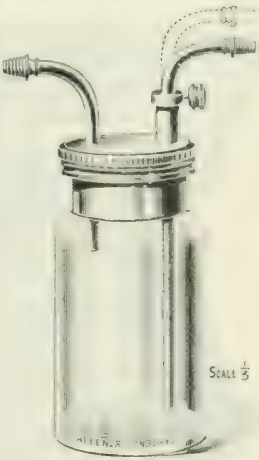

Fig. 144.

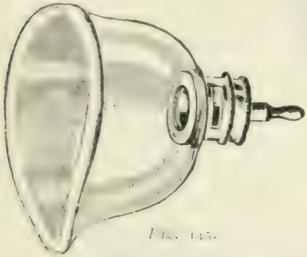

Fig. 145.

Oxygen Face-piece.—This is made of glass with metal mount and tube, shaped to fit the contour of the face. It is easily sterilizable. The curved metal mount can be turned to any position (*Fig.* 145). It is very convenient in use, and most practicable. Costs 6/6. Reynolds & Branson Ltd., Leeds.

Pneumothorax (Artificial Induction of).—A very simple and practical apparatus for the induction of artificial pneumothorax is supplied by Messrs. Reynolds & Branson, of Leeds, who furnish full directions for use, and also a pamphlet giving suggestions for the operative procedure. The nitrogen is obtained from the atmosphere, the oxygen being absorbed by alkaline pyrogallate, nitrogen then being available. It has been used with perfect success at the Armley Hospital for Consumptives, Leeds, and in the tuberculosis wards of the Leeds City Hospitals. We give an illustration of the apparatus (*Fig.* 146), and also one showing the needle fitted with a hypodermic syringe for the vein test (*Fig.* 147). Price complete £3 3s.

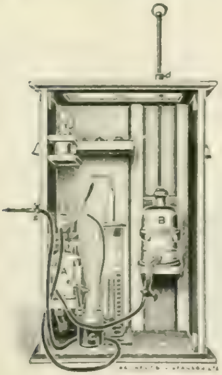

Fig. 146.

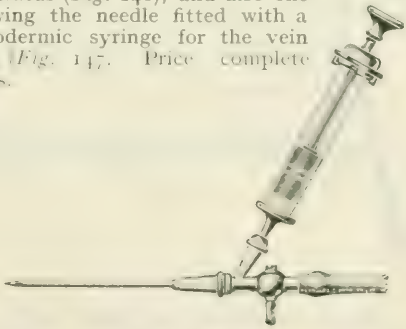

Fig. 147.

Pocket Cases.—*The Aseptic Miniature Pocket Case* is about the size of an ordinary cigarette case (*Fig.* 148). It contains miniature but quite efficient instruments to meet the very minor surgery of everyday practice. There is a two-bladed knife—full size, with curved abscess blade, and also tenotomy blade—an excellent exploring-needle director, and probe, which when screwed to holder make full-sized instruments. There are scissors, and artery and dressing forceps, which are small but quite useful. The aseptic metal case is enclosed in a chamois purse, and we find that a tube containing a suture and needle in aseptic solution will fit into the purse with the case (*see* Ligatures, Emergency, p. [illegible]). We recommend this addition as it will enable us to meet cases of wounds requiring sutures. Price [illegible]. R. Sumner and Co., Liverpool.

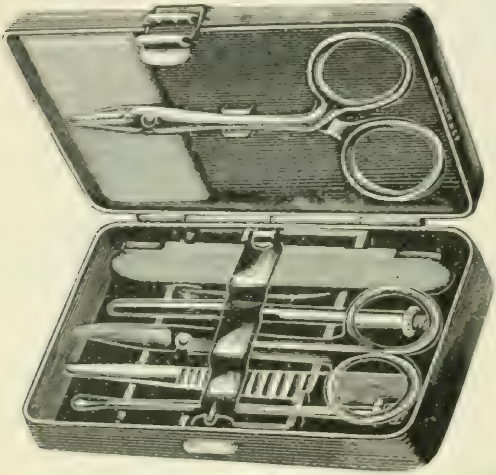
Fig. 148.

The "Surgman" Flat Metal Pocket Case, for waistcoat pocket (*Fig.* 149), contains three all-metal knives, i.e., one each Paget's, Syme's, and scalpel, and costs 7/6 complete. The Surgical Manufacturing Co., 85, Mortimer St., W.

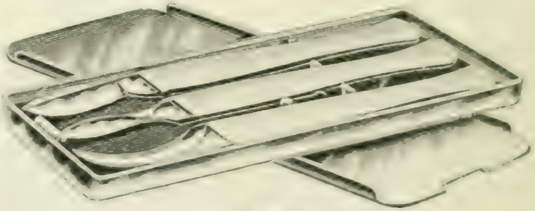
Fig. 149.

Pyne-U-Ca Health Box.—A simple attachment to the cistern of the lavatory which ensures the water being charged with a disinfectant when the chain is pulled. It costs 2/6, and a renewal charge for [illegible] costs tenpence. The method is much in use, and the fluid has great antiseptic power. The Medical Supply Association, London, W.C.

Retractors.—*Douglas Shield's Retractor* is a new form possessing many good points. It has been found extremely useful in cases of appendicitis, goitre, and general operative work of this description. The cross handle is an advantage, saving the aching and strain of the fingers or hands of the assistant in a lengthy operation (*Fig.* 150). Allen & Hanburys Ltd.

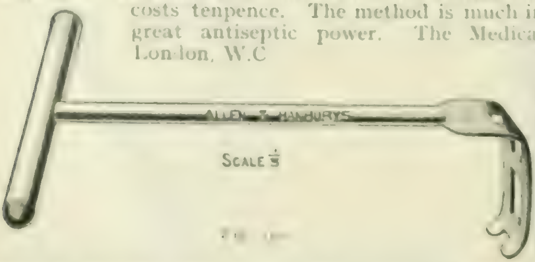

Fig. 150.

Abdominal Retractor.—In many abdominal sections a suitable exposure of the field of operation adds considerably to the facility of their performance. This is particularly true in gynæcological work, in which the depth of the pelvis affords additional difficulty in any surgical procedure. Frequently a retractor is needed that not only gives ready access to the site of operation, but is of simple design and manipulation. It should be capable of easy enlargement, and it should be possible to alter the position or inclination of any blade without interfering with the instrument as a whole. To meet these conditions, Mr. Harold Chapple, Obstetric Surgeon at Guy's Hospital, has devised the abdominal retractor shown in the illustrations (*Figs.* 151–152). It is simple, light, of small bulk, and introduced with ease. After introduction, it is self-retaining and remains absolutely fixed, and attachment or detachment of any blade can be speedily accomplished. Enlargement is readily effected in either direction. Special blades have been also devised for attachment in any position at either end of the retractor; e.g., in pelvic work, the intestines, after being packed off with gauze, are held aside by a special framework (*Fig.* 152), which is connected to the frame of the instrument. Down Bros. Ld., St. Thomas's Street, London.

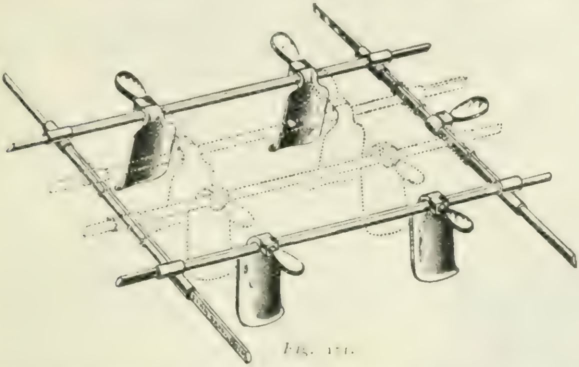

Fig. 151.

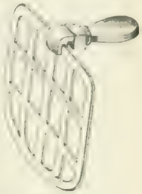

Fig. 152.

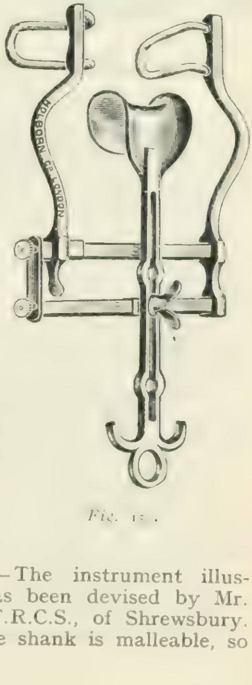

Fig. 153.

Balfour's Three-bladed Abdominal Retractor, which we illustrate here (*Fig.* 153), is simple, easily adjusted, and rigid. It costs 25/–. The Holborn Surgical Instrument Co. Ltd.

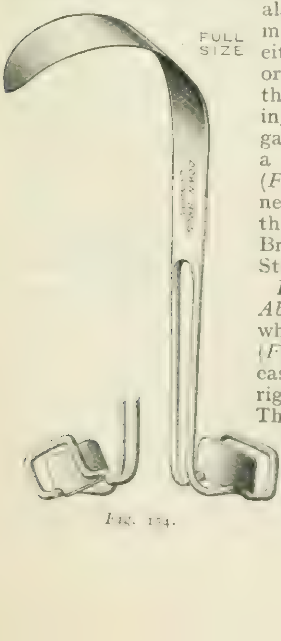

Fig. 154.

Eyelid Retractor.—The instrument illustrated (*Fig.* 154) has been devised by Mr. C. G. Russ Wood, F.R.C.S., of Shrewsbury. The lower part of the shank is malleable, so that it can be adjusted to a prominent orbital margin; at the same time no pressure whatever is caused on the eyeball itself. The solid upper blade presses the cilia out of the way of any instrument which is being used on the globe, and when in use the shank rests on the forehead, so that only slight pressure from the bent finger is required to retain the elevated lid in its place. Down Bros. Ltd., St. Thomas's Street, S.E.

"Salivoyds." Under this name compressed pads are prepared for absorbing the saliva. They should prove especially useful to dentists. The Medical Supply Association.

Salvarsan Apparatus. Mr. Alfred Allport has designed a convenient portable outfit for intravenous injection (*Fig.* 155). It consists of an ordinary round sterilizing drum, into which is fitted a metal tank about 4in. deep. Into a rack somewhat like a cruet-stand with a handle, fits a 20-oz. graduated measure for mixing the solution, a glass rod, and a small 50 cm. measure for the sodium hydrate solution (if neo-salvarsan be used, these two measures are not needed); two 300 cm. graduated glass vessels (Ehrlich), one for the saline solution or distilled water, and one for the salvarsan or neo-salvarsan solution; a 30-oz. stoppered bottle for the saline solution or distilled water, and two clips for the glass syringe. After an injection has been given, the Ehrlich glass which contained the salvarsan solution is thoroughly well rinsed three or four times by vigorous shaking with the saline or distilled water which has been left over from the operation, the covers are put on both glasses, and they are replaced in the rack with the other ware; the rack is fitted into the drum, and the whole outfit sterilized in the sterilizer. There is room on the top of the vessel for a couple of towels and some dressings. The injection needle is a slight modification of McDonagh's needle. It has a more convenient handle, and a plain flat plate by which it can be secured to the limb with a small strip of adhesive strapping. The whole apparatus in its sterilizer drum fits into a canvas waterproof cover with a leather handle for carrying, and is very compact and portable. Down Bros. Ltd.

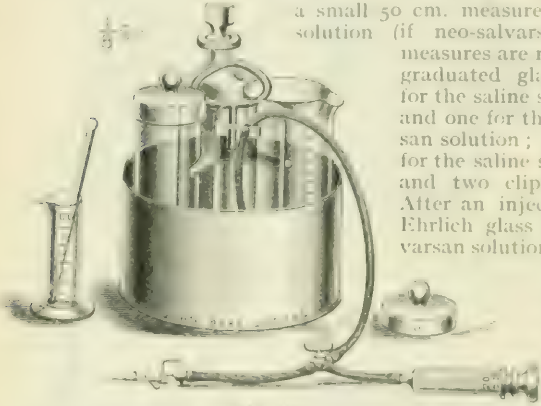

Fig. 155.

Salvarsan Needle (Intravenous). We illustrate in *Fig.* 156 the form of needle which is in regular use at St. Bartholomew's Hospital for intravenous injection. The tube with plug is used to make sure the needle is in the vein. The Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

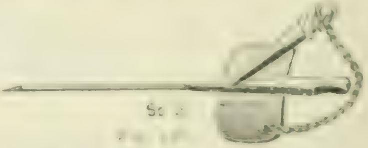

Fig. 156.

Salvarsan Syringe.—The salvarsan syringe (*Fig.* 157), which has been made to the design of Mr. H. L. White, claims to possess the following advantages over the syringe in ordinary use: (1) Large capacity, 100 c.c.; two syringefuls complete any dose; this saves time and minimizes the leakage of air which enters every time the two-way tap is turned for refilling. (2) A surrounding metal case, protecting against breakage. (3) The end-piece, bearing the nozzles, is of metal; this also minimizes the chance of breakage. (4) Both nozzles are bulbous, not cylindrical; those of the tubing cann tightly, allowing less leakage of air. (5) The tube which lies in the solution is weighted. (6) The needle is fitted with a stylet, so arranged that if the former be blocked by a subcutaneous blood clot, it can be cleared without removal; this avoids the pain of repeated skin punctures. Mayer & Meltzer, 71, Great Portland Street, W.

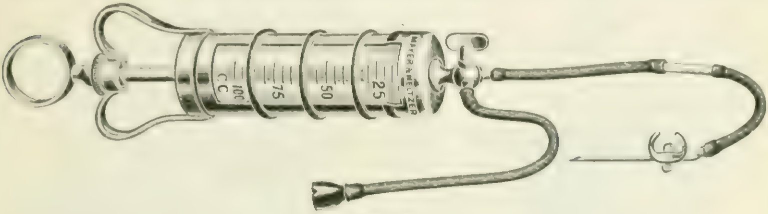

Fig. 157.

Screw and Screw-driver for Operative Treatment of Fractures. The screw-driver, as shown in *Fig.* 158, has projecting from its end prongs, four in number, which fit into corresponding notches at the margin of the head of the screw. A very secure "bite" is thus obtained, the screw-driver having no tendency to slip off the end of the screw, as so often happens with the form in common use. It is also more easy to drive the screw straightly home, there being no tendency to deviation. The screw-driver is magnetized, so that the screw can be carried to the bone on its end, and placed in position without any screw-holder. Nothing, therefore, should touch the screw after it has once been put in place on the end of the driver. The screw can be driven in flush with a Lane's plate, as the end of the driver is the exact size of the head of the screw. The advantages over the ordinary screw-driver and screw are the more secure "bite" and the portability gained by magnetization. Allen & Hanburys Ltd., 48, Wigmore Street, W.

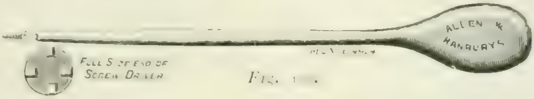

Fig. 158.

Spirit Lamp (Improved).—The ordinary spirit lamp is a very crude affair. This one has a nickel-plated burner, with arrangement for regulating the flame and putting it out before the cap is applied. It is an enormous advance on the ordinary form. Price 3/6. The Medical Supply Association.

Splint Material (*Fig.* 159).—Under the name of "Pexuloid" a new material has been introduced which is of a celluloid character, but not inflammable. It is very light and rigid, and a very perfect model of the part can be produced. It is necessary for the surgeon to make a plaster cast of the part for which the splint is required, and from this the "Pexuloid" appliance is made. For splints which have to

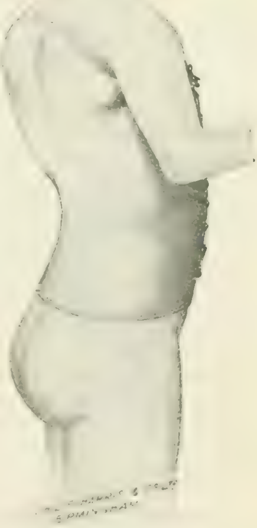

Fig. 159.

be worn for a considerable time it offers many advantages, as regards both lightness and cleanliness, over existing materials. It can be taken off and sponged when necessary, and then put back by simply lacing it. Philip Harris & Co., Edmund Street, Birmingham.

Sponges (Surgical). Bernays's sterilized compressed absorbent cotton sponges will open out to ten times their thickness and have as much absorbing power as a large-size wad of gauze or wool. They are supplied in boxes containing four dozen sponges at 3/6 per box, by the Medical Supply Association, Gray's Inn Road, W.C.

Spray (Dental and Medical). This spray (*Fig.* 160) is designed by Mr. Frank A. Rogers for dental work where a strong effective spray is required, but we do not see any reason why it should be limited to this purpose. We are very sceptical about sprays, as so much rubbish is put upon the market. It is an appliance which has usually gone wrong when one wants to use it. In this spray the tube is glass all through, of a sufficiently wide calibre, so that it will not be easily occluded. It has a conical bottom, so that small quantities of fluid can be used with a spray of full size, with the result that greater power is obtained. The stand is made of india-rubber on the suction principle, so that it adheres firmly to the glass or polished table and cannot be overturned. The spray is lifted out of the stand when required for use. We consider all the essential principles of a really practical spray have been combined in this instrument, and further modifications can be made in adapting the nozzle to the nose, pharynx, etc., which we hope the manufacturer will do. Frank A. Rogers, 327, Oxford Street, W.

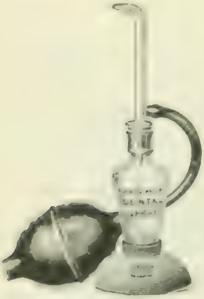
Fig. 160.

Spray Tube.—The "Grevillite" automatic spray tube requires no spray bellows. It is a tube with cork attached. All that is necessary is to place the tube in a bottle of fluid, pass the finger through a ring, and work the spray tube up and down, by which a very powerful spray is obtained. While well adapted for spraying rooms, etc., it would not keep the spray directed on a definite point, so that it would not be suitable for the throat. Price 2/3. The Medical Supply Association, Gray's Inn Road, W.C.

"*Bristol Auto-Spray.*"—A similar auto-spray is supplied by Messrs. Ferris and Co. Ltd., of Bristol.

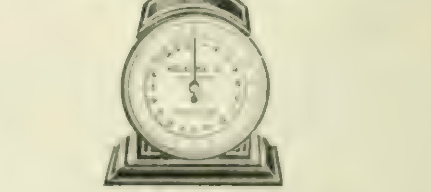
Fig. 161.

Spring Balance.—The disadvantage of the basket upsetting is avoided in this scale (*Fig.* 161). It is easily slid into the balance and cannot be upset. It is graduated in ounces to weigh up to 20 lb., and costs 18/6. The Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

Sterilizers for Dressings.—A new sterilizer with vacuum attachments (*Fig.* 162) has been produced, which will render dressings absolutely sterile and dry in thirty minutes. The drum measures 10½in. by 7½in. It is fitted with a Bunsen burner, and costs, complete with stand, £6 10s. The Surgical Manufacturing Co., 85, Mortimer Street, London, W.

Another sterilizer (*Fig.* 163), produced by Messrs. R. Sumner & Co., of Liverpool, uses super-heated steam for purposes of sterilization. It is made of strong brass, nickel-plated, and is supplied with nickel-plated sterilizing box to hold the dressings. The heat is obtained from a wickless spirit lamp, and the weight is 9 lb. It is a perfectly devised apparatus, and costs £3 7s. 6d.

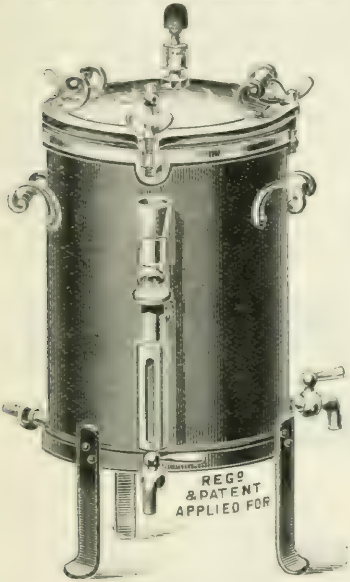

Fig. 162.

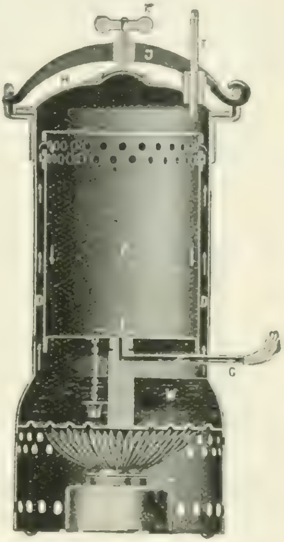

Fig. 163.

Sterilizer for Hypodermic Syringes. Hemsted's sterilizer (*Fig.* 164) consists of an ordinary test-tube fitted with spring clip which forms a stand. The water rapidly boils over a spirit flame, and the syringe can be taken out without the aid of forceps and rapidly cools on its stand, and is ready to have the vaccine drawn into it. It is also useful for sterilizing probes and small scalpels. The holder allows the test tube to stand on any surface, thus avoiding the spilling of water. It can be easily carried in the pocket. Price 7/6, from the Medical Supply Association.

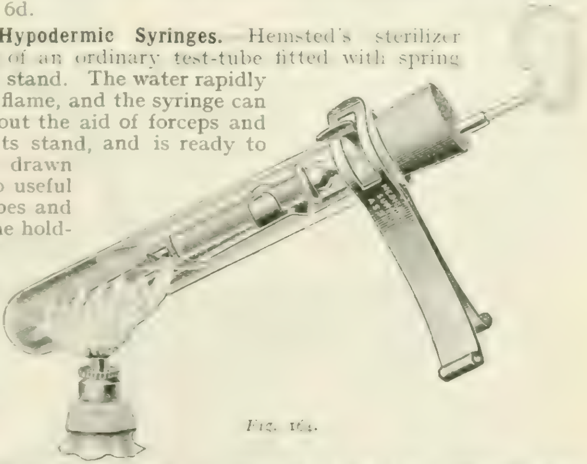

Fig. 164.

Sterilizers for Instruments.—The *"Grevillite" Lock Lid Sterilizer*, with tray for small instruments, is made of copper and tinned inside. It has folding legs, which reverse and form a lock for holding the lid in position. It has two burner lamps. Size 8 in. by 2 in. by 2 in. This is the cheapest and most practicable sterilizer for small instruments which has come under our notice. The Medical Supply Association.

A cheap sterilizer, for small instruments, forceps, scissors, etc., is made of an iron enamelled mug with wire gauze tray, heated by means of a Bunsen burner or spirit lamp (*Fig.* 165). It measures 4 in. deep by 5 in. diameter, and the price without burner is 4s. This is well suited for surgery or hospital use, but is not portable. Made by Reynolds & Branson, Leeds.

Sterilizer for Sutures.—A glass jar with ground-in glass stopper, containing a metal frame for holding six tubes of sutures immersed in alcohol. When required for use, the frame is drawn to the top of the jar and held there by two hooks. Price, complete with sutures, 7/6. A larger size, to hold eighteen tubes, 10/6. The Medical Supply Association.

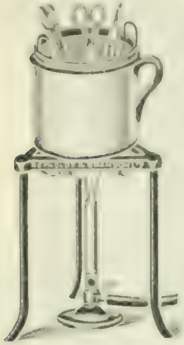

Fig. 165.

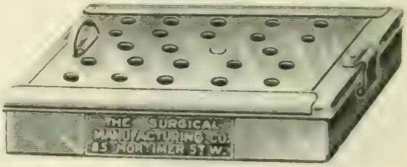
THE SURGICAL
MANUFACTURING CO.
85 MORTIMER ST W.

Fig. 166.

Sterilizing Box for Gloves.—*Fig.* 166 illustrates a very convenient appliance for sterilizing and carrying india-rubber gloves. Produced in various sizes by the Surgical Manufacturing Co., Mortimer Street, W.

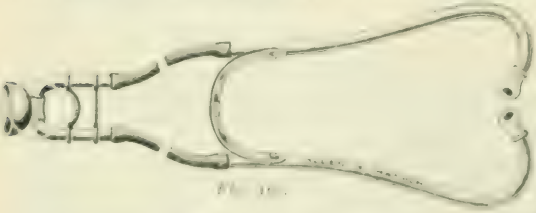

Fig. 167.

Stethoscope. This has an aluminium earpiece (*Fig.* 167) which is made to revolve for convenience in examining the back and sides of chest. It has a hinged spring, and tubes of equal calibre throughout. Designed by Dr. Gordon Copeland and manufactured by Allen and Hanburys Ltd.

Stomach Evacuator. The advantage of this stomach tube is its simplicity and cleanliness. The contents of the stomach can be drawn into the bottle and taken away for examination, a rubber stopper and cap being supplied to close the bottle. The illustration (*Fig.* 168) will show the simple mechanism of the invention, which is exceedingly practical. The Holborn Surgical Instrument Co. Ltd.

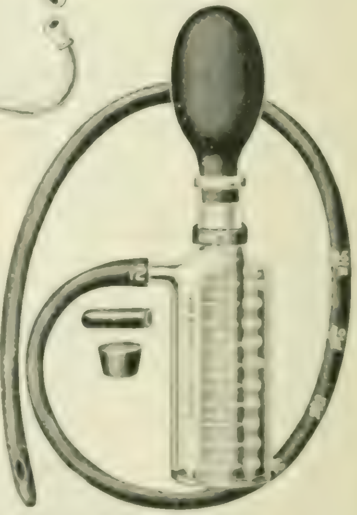

Fig. 168.

Stomach Tube.—" Lonings " india-rubber stomach tubes have two eyes and closed ends. These tubes being oval, they are more easily introduced, especially in cases of slight œsophageal strictures, and have thick walls which prevent the tube collapsing while in use. Price 7/6 each from the Medical Supply Association.

Surgical Cases.—(*See* ASEPTIC INSTRUMENTS, p. 689.)

Suspensory Bandages. Under the name of the " Stow-away," the Domen Belts Co. Ltd., 456, Strand, W.C., have produced the most comfortable and efficient suspensory bandage which has come under our notice (*Fig.* 169). The cover is made of white cotton or pure wool, and the testicles are held well up by means of elastic bands. We can highly commend this support. The cost is from 1/6 to 5/–, according to quality.

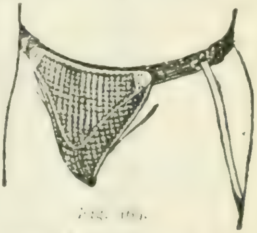
Fig. 169.

Suture and Ligature Spool-Attachment.—Mr. B. Richardson Billings has devised a suture and ligature spool, whereby rapid and easy suturing and ligaturing can be accomplished (*Fig.* 170). The apparatus is a substitute for the more expensive " sewing machines " which have been devised from time to time, and consists of a light metal reel on a framework, which can be attached to most of the needle-holders in common use, or even to a pair of Spencer Wells' artery forceps. The reel has deep flanges, which are perforated, allowing for thorough sterilization of its contents. Its axle is instantly unmountable from the frame, by the turn of a milled nut on either side. The needle is half curved, with the eye at the point; and, unlike the ordinary variety, once it is in the holder it need not be released. This alone saves some seconds per stitch. The needle is threaded and passed through the tissues in the ordinary way, the free end is then gripped with forceps, and the needle brought back again through the hole made, along the thread, which is then cut between tissues and needle. This is one suture made, and the needle is ready for the next. A continuous suture can be adapted with slight modification, while for rapid ligaturing the advantages are obvious. The attachment is cheap, adaptable, simple, efficient, clean, instantly changeable (allowing different materials or sizes to be used), time-saving, and practical. The Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

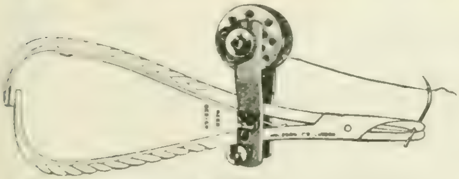
Fig. 170.

Syringe (Record Type). This instrument is graduated to 80 min. (*Fig.* 171), with very fine electro-plated nozzle to fit ureteric catheters. It is recommended by Mr. Thomson Walker for washing out ureteric catheters, and also for washing the pelvis of the kidney. Allen & Hanburys Ltd., 48, Wigmore Street, W.

Fig. 171.

Syringe Forceps. As will be seen from *Fig.* 172, these forceps are handy for picking up syringes, etc., which the ordinary pattern of sterilizer forceps will not do. The Holborn Surgical Instrument Co. Ltd. supply these.

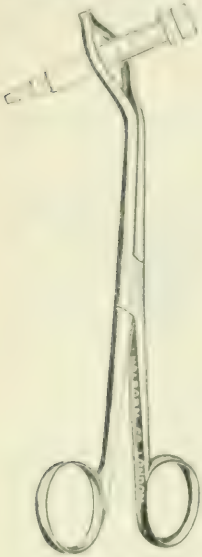

Fig. 172.

Test-tube Holder.—This is designed so that it can be attached to the spirit lamp. The tube can be fixed at any angle. It is quite ingenious and practicable. Price 1/3, from the Medical Supply Association.

Test-tube Stand.—This is a metal stand for holding test-tubes or bottles, in sets of three sizes. The test-tube is passed through the stand, so that the spring portion of the stand fitted with the metal plate rests on the table and will hold the test-tube upright. Price 1/3 per set, from the Medical Supply Association.

Tongue Depressors.—The handle of this instrument (*Fig.* 173) has an admirable grip, and the blade being narrow allows the full view of the tongue, and cavity of the mouth. We have found it most efficient in cases of high-backed tongue. The shape gives greater control than the ordinary tongue depressor. Price 3/6.

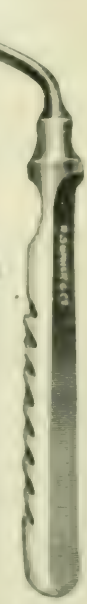

Fig. 173.

Double-Ended Metal Fenestrated Tongue Depressor (*Fig.* 174).—This is also a very handy depressor, the fenestrations admitting a good view of the surface of the tongue, but it does not compare in efficiency with the above instrument. Price 2/6. R. Sumner and Co. Ltd., Liverpool, supply both these instruments.

Fig. 174.

Tonsil Enucleator.—Mr. Howard Warner, M.B., has designed an enucleator (*Fig.* 175) for use in the complete removal of tonsils of the following types: (*a*) The ordinary enlarged tonsil, over the anterior surface of which the anterior pillar of the fauces is spread and firmly adherent. (*b*) The small, fibrous, embedded tonsil, the subject of repeated attacks of follicular inflammation, which cannot be properly introduced into the guillotine. In using the enucleator the tonsil is grasped with traction forceps and pulled gently inwards and the mucous membrane is divided with the extreme tip of the enucleator, which is the only part approaching to sharpness, between the anterior pillar and the

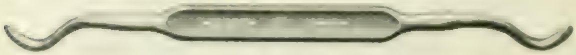

Fig. 175.

tonsil. The curve of the blade enables the operator to separate the body of the tonsil completely from its bed, working from above downwards, and finally the lower pole, which is hanging only by mucous membrane, may be separated. The enucleator is double-ended, thus being suitable for either tonsil, and is curved slightly on the flat; this does not show in the illustration. The blades are quite blunt, except the extreme tips, which are half-sharpened only. The Holborn Surgical Instrument Co.

Tonsil Forceps. The instrument illustrated (*Fig.* 176) will be found of particular advantage in dealing with tonsils that are not easily accessible to the guillotine alone. The distinctive features are: (1) The blades curve sharply at right angles close to the jaws; the jaws open and close in the vertical plane, thus enabling the operator easily to get a firm grip of the tonsil; (2) The jaws have short, saw-shaped teeth, giving a firm hold and affording plenty of room between the blades when opened, an advantage in working in the small space available; and (3) The instrument passes conveniently through the fenestra of a guillotine or the loop of a snare. Designed by Arthur J. Hutchison, M.B., and made by Down Bros. Ltd.

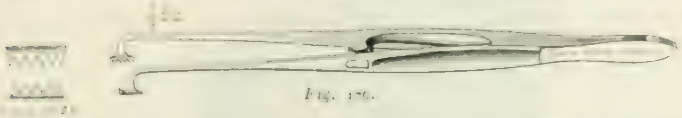

Fig. 176.

Tonsil Probe. The instrument here illustrated (*Fig.* 177) has been devised by Mr. H. Tilley, to expedite the examination of imbedded tonsils. If the outer portion of the tonsil is pressed upon, the gland tends to face the observer, and septic accumulations may be expressed that otherwise might pass unnoticed. It is useful for obtaining a more complete view of inconspicuous tonsils which often conceal septic accumulations. It may also be used in cauterizing or operating on tonsillar crypts. Mayer and Meltzer, 71, Great Portland Street, W.

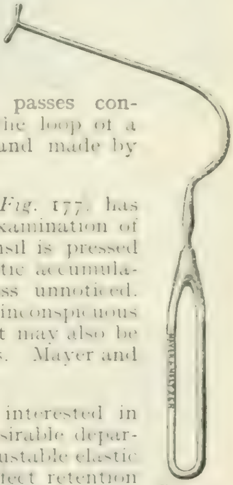

Fig. 177.

Truss (Adjustable Elastic).—We have been much interested in this appliance, which is an entirely new and very desirable departure in the manufacture of trusses. It has a soft adjustable elastic band (*Fig.* 178), of sufficient strength to give a perfect retention without discomfort. There is a double line of draft over the front piece and pad, whereby the pressure can be regulated and applied to either the top or the bottom of the pad, as may be required. This enables an even inward and upward pressure to be obtained on the pad without pressure on the understrap. It also has a new air-cell pad, made in all shapes and sizes to fit the body correctly. The steel spring round the body is done away with. It makes it easy to fit the patient comfort-

Fig. 178.

ably and apply the pressure just as wanted. The cost is quite reasonable. William S. Rice Ltd., 8, 9, Stonecutter Street, E.C. are the makers.

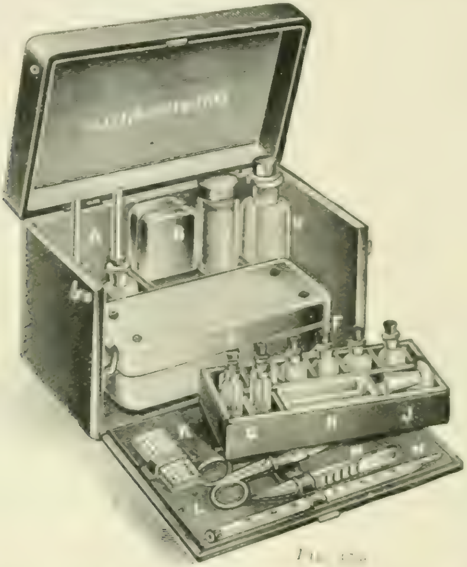

Fig. 159.

Tuberculin Cases.—*Fig.* 159 illustrates a portable case designed by Dr. Hyslop Thomson, containing every requirement for use by tuberculosis officers and dispensaries. Made by Allen & Hanburys Ltd.

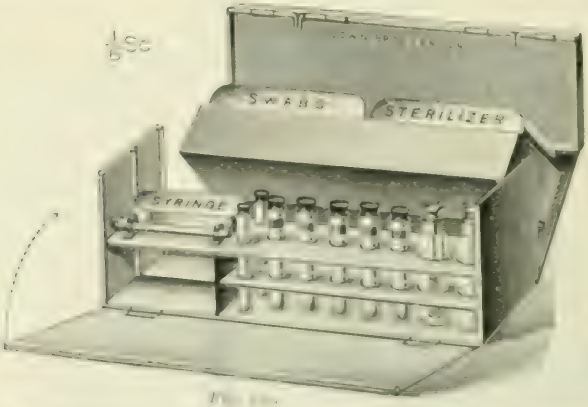

Fig. 160.

We also illustrate (*Fig.* 160) another tuberculin outfit suggested by Dr. F. H. R. Harries, and made by Down Bros. Ltd.

Urinals.—The effectual cleansing of earthenware urinals has hitherto presented some difficulty owing to the need for construction in a form designed to ensure the retention of their contents when in use. Sister Harbott, of the West Ham Infirmary, has designed an improved model (*Figs.* 181, 182), which while in nowise departing from these lines, provides in addition an

Fig. 181.

Fig. 182.

opening which will admit the hand or a mop for thorough cleansing. Down Bros. Ltd., St. Thomas's Street, S.E.

Female Urinal.—The "Christie" urinal (*Fig.* 183) helps us to solve a problem. There is always a difficulty in getting the female patient to pass water in the dorsal position. The shape of the vessel under notice, and its open character, has much to recommend it, and it should prove of great convenience. The Hospitals and General Contracts Co. Ltd., 25–35, Mortimer Street, W.

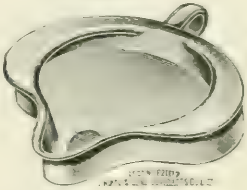
Fig. 183.

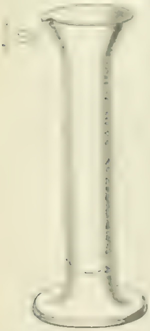
Fig. 184.

Urine Specimen Glass.—Drs. Rideal and Beddard have introduced an improved specimen glass (*Fig.* 184), the advantages claimed being a small calibre, so that about 1 oz. of fluid will freely float an ordinary urinometer; a blunt conical bottom to enable sediment to be collected, and for ease of cleaning; and a funnel-shaped top to hold filter paper. Down Bros. Ltd.

Vaporizers.—A very inexpensive and efficient vaporizer, the "Ariel" (*Fig.* 185) has been introduced by the Holborn Surgical Instrument Co., 26, Thavies Inn, E.C. It has a great variety of uses both in the sick room, and also for domestic purposes. It is heated by a small lamp burning ordinary petroleum, and any form of medicament can be vaporized, such as pine oil, eucalyptus, oil of lavender, carbolic acid, etc. It also acts as a night-light in the sick room. It is a well-made, ornamental, and practical appliance, and we can recommend it. Cost, complete, 2/6.

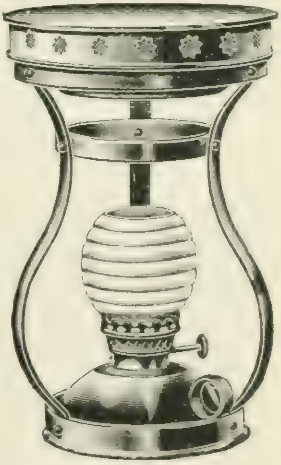
Fig. 185.

X-ray Apparatus (Rotary High Tension).—*X*-ray workers have been specially interested during the last year or two in the various rotary high-tension rectifiers that have been put on the market. They have in most cases been far from satisfactory for various reasons, but principally because they produce inverse current in the tube, and because of the rapidity with which they destroyed the *x*-ray tubes. Another defect was the failure of the insulation. Other disadvantages were the noise of the apparatus when working and the large amount of floor space that it occupied. These defects have been eliminated in the new apparatus recently perfected by Mr. Gaiffe. The best testimony of its value is that it gained the unique award of the Grand Prix at the recent International Medical Congress in London in August, 1913, where it was in competition with all the well-known instruments of its class.

From the illustration (*Fig.* 186) it will be seen that the Gaiffe apparatus differs essentially from all preceding rectifying machines. It is of vertical type, and the ground space it takes up measures only 2ft. 9in. by 3ft.; the height is 6ft. 9in. It is of all machines the most silent, and is absolutely free from vibration. One great advantage of the apparatus is its remarkable flexibility: it serves equally well for treatment-work requiring the smallest current, and for rapid radiography requiring the most powerful. The spark can be varied by delicate adjustments between the minimum of less than ½ in. to the full distance between the discharging pillars. The discharge in the tube is absolutely free of inverse current, the strain on the tube is reduced to the minimum, and as a result, the length of life of the tube is greater than on any other form of apparatus, greater even than on an ordinary coil working from an interrupter.

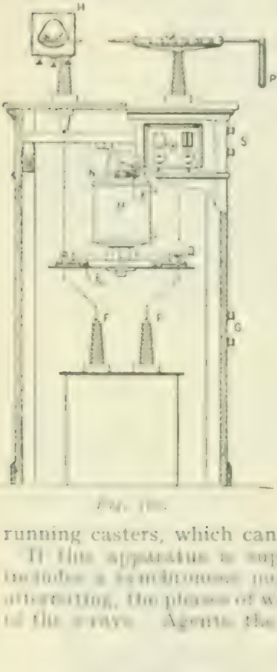

Fig. 186.

For screen work the illumination is steady. Breakdown is not likely to occur, because the insulating material, consisting neither of wax, resin, nor oil, can be absolutely relied upon. The machine does perfectly for high-frequency work, giving very fine effluves, and on the couch, a milliampèrage of much greater range than is required for medical practice. The apparatus works either on continuous or alternating current, and the price, £150, includes a movable switch-table mounted on easy-running casters, which can be wheeled to any part of the *x*-ray room.

If this apparatus is supplied to work on continuous current, the price includes a synchronous motor, which converts the continuous current into alternating, the phases of which alternating current are used in the production of the *x*-rays. Agents, the Medical Supply Association.

PROGRESS OF PHARMACY, DIETETICS, &c.

Acitrin, sold by the Bayer Co. Ltd., 19, St. Dunstan's Hill, E.C., in ½-gram (7½ grs.) tablets, is described as an ethyl ester of phenyl-cinchoninic acid. It is destined for use in gout as an eliminant of uric acid, and like other preparations of allied chemical composition such as atophan, is receiving considerable attention at the hands of German clinicians (see p. 1).

Adamon, for which we are also indebted to the Bayer Co., is a combination of bromide and valerian without the unpleasant characteristics of the latter. We have given this drug a restricted trial and found it efficient and pleasant. It is particularly indicated in neurotic conditions, on which it exercises a mild sedative action. In mild cases one tablet (7½ grs.) is given three or four times daily; while two tablets given shortly before bedtime are of value where there is excitement with a tendency to insomnia. We have pleasure in stating that extended experience has confirmed our favourable impression of **Adalin,** another bromide compound used as a mild sedative which is issued by the Bayer Co. For insomnia of a mild order, such as is encountered in neurasthenics, we have found it very useful.

"Agmel" (Succus Agavæ Concentr.) is a preparation with an interesting history. Since the sixteenth century the Mexicans have used "aguamiel," the fresh sap of the pulque maguey, in the treatment of renal and urinary inflammations; but of late years its reputation has spread beyond the country where it is indigenous, and it is said that renal patients are being sent to Mexico from other lands for an "aguamiel cure." Encouraged by this, the local pharmacists have prepared "Agmel"—a concentration of aguamiel to the consistency of honey—for foreign sale. The British agents are Messrs. Mase & Partners, 15, King Street, West Smithfield, E.C. It is usually administered in doses of a tablespoonful, freely diluted with water, three or four times daily; dilution may be dispensed with, but the sickly sweetness of the preparation will be found too much for most stomachs unless it is watered down. According to Dr. C. S. Dolley, of Mexico City, "it is most widely used in diseases of malnutrition, especially where this has led to diseases of the kidneys and bladder." The results of a critical examination of this drug, such as is likely to be undertaken by various observers, will furnish interesting reading.

Airol (The Hoffmann-La Roche Chemical Works Ltd., 7 & 8, Idol Lane, E.C.)—This is an oxy-iodo-gallate of bismuth, sent out in powder form, for use as a dusting powder, as an unguent, or in suspension. It is said to combine the antiseptic action of iodine, which is liberated by contact with moisture, with the astringent properties of gallic acid and the absorptiveness of bismuth; and is therefore of value in the treatment of ulcers, granulating surfaces, intertrigo, etc.

"Aseptoid" Mercuric Soap.—This soap, prepared by Messrs. Oppenheimer, Son & Co., Ltd., contains 2 per cent of mercuric iodide. This is well known to be an excellent antiseptic, powerful and yet not injurious to the tissues; while the soap itself is pleasant, bland and non-irritating to use. Whether these soaps are so powerfully antiseptic as they would seem to be from theoretical considerations, it is very hard to judge except by actual experiment; the manufacturers claim that this preparation has a high bactericidal coefficient.

"Bisedia," prepared by Messrs. Giles, Schacht & Co., Clifton, is so well known that any recommendation seems almost superfluous. It is a combination of Schacht's liquor bismuthi with liquid pepsin and sedatives (morphine hydrochlor. gr. $\frac{1}{24}$, ac. hydrocyan. dil. ♏. ii, in each drachm). As a gastric sedative in the various disorders and diseases of the stomach that are associated with obstinate vomiting, we have found this a most reliable combination. It has the advantage of being pleasant in appearance, smell, and taste. The name "Bisedia" has been adopted in the place of the former "Liquor Bismuthi Sedativus" to guard the public from worthless imitations sold under the above title.

Bismuth and Pancreatin.—The special claim of this preparation is that it combines the alkalinity which is essential to the proper action of fluid bismuth preparations, with pancreatic ferments whose proteolytic action is not interfered with by the presence of a small quantity of alkali. The dose is 1 to 2 dr., and it is prepared by Mr. W. Martindale, 10, New Cavendish Street, W.

Bismuth Gauze.—Messrs. Burroughs, Wellcome & Co. have sent us a "tabloid" parcel of this form of dressing. It contains six neat little rolls of gauze, each a yard long and half an inch wide; each roll is sterilized and enclosed in a covering which keeps it sterile. This size is specially destined for use in ear, nose and throat work.

Brain Extract.—Mr. W. Martindale sends us this new effort in organotherapy. It was prepared at the instance of Dr. Maule Smith, of Bromsgrove Asylum, for use in cases of dementia, delusional insanity, etc., and is said to have produced good results in these conditions. It is made from the brains of healthy full-grown sheep and cattle.

Carlsbad Sprudel Salt, Natural. Messrs. Ingram & Royle Ltd., warn the profession that in prescribing this they must specify the *natural* salt, since there are many artificial preparations on the market.

Cerettes are neat flexible gelatine containers filled with ointments or medicated soaps. To use, the extreme tip of the container is cut off and the contents used as required. This is a conveniently portable packing for unguents, free from the disadvantages of contact with metal. The sample sent us by the makers (Messrs. Oppenheimer, Son & Co., Ltd.) contained a yellow oxide of mercury ointment with atropine and cocaine, an ointment frequently wanted at short notice by the medical man; these "cerettes" are eminently suited for carriage in the bag.

Coagulose is a Parke Davis hæmostatic ferment obtained from normal horse serum. It is sent out in sealed bulbs, each of which contains a single full dose. Directions as to dosage and administration are given with each package. In the present volume various references will be found expounding the value of this form of therapy in hæmorrhagic conditions.

Collosols are colloidal preparations of metals made by Messrs. Oppenheimer. This is a new step in pharmacology, the object being to offer the practitioner the antiseptic properties of silver, mercury, etc., in a form innocuous to the human subject. "Collosol Argentum" and "Collosol Hydrargyrum" are said to fulfil the purpose equally well, preference being given to the latter in cases with a syphilitic taint. "Collosol Ferrum" is intended for use wherever iron is indicated for medicinal purposes. They may be given by intramuscular or intravenous injection, or by mouth; in the latter case they must be given an hour or two after a light meal and no further food taken for at least two hours, since they absolutely inhibit digestion. They are issued in ½ oz. bottles and in sterile "Aseptules" each containing 15 minims.

Copper, Colloidal.—This is also an Oppenheimer product, sent to us in "Aseptule" form. Administered by hypodermic or intramuscular injection, it is said to yield astounding results in cancer. We hope this may prove correct, though some of our experiences in this direction have not been altogether encouraging. In so dire a disease, however, every means of cure deserves the fullest consideration and trial.

Cosmin. Iodi Decolorata (Messrs. Sumner & Co. Ltd., Liverpool).—The use of iodine ointment has been greatly extended in recent years by the fact that non-staining preparations are now available. The ointment now under notice belongs to this category, and is a singularly successful example; it contains 5 per cent of iodine loosely combined with a purified hydrocarbon basis. It costs 4/- per lb.

Cream of Malt with Sicilian Olive Oil.—This is a highly satisfactory combination of an easily assimilable fat, in a pure form, with malt of a high diastatic activity. The manufacturers, Messrs. Oppenheimer, Son & Co. Ltd., have issued quite a series of "cream of malt" preparations, of which this is one.

Crolas Oil, sent to us by M. [illegible] & Co., Gamage Buildings, Holborn, E.C., is a tasteless, odourless preparation of castor oil, a drug which never goes out of fashion. It is a remarkably successful product in its disguise of the unpleasant qualities that have made castor oil a by-word in generations of [illegible].

Cuprokrol (Messrs. Reynolds & Branson Ltd., Leeds) is a copper ointment with the astringent and parasiticide properties of that metal, presented in a pleasant form for use in tinea and similar affections of the skin.

Cycloform Co., Ung. (The Bayer Co. Ltd.).—This contains a benzoic acid derivative, cycloform (10 per cent), with antiseptic and anæsthetic properties, with hamamelis and oxide of zinc. It forms a pleasant and soothing emollient, which may be used on a large scale without fear of toxic effects.

Diabetic Foods. Messrs Callard & Co., 74, Regent Street, W., call our attention to the emphasis laid upon diet in diabetes, at the recent international congress, and to the foods with which their name is inseparably associated, such as "Casoid" bread. We need do no more than remind our readers of the long and unique experience which this firm has enjoyed in catering for the needs of sufferers from diabetes.

Messrs. Maurice & Co., Bedford Chambers, Covent Garden, W.C., have also forwarded us samples of biscuits intended for diabetics. Some of these biscuits are stated by the makers, Rademann's Nahrmittelfabrik, to contain as follows: Diabetiker Bis., 32 per cent proteids and 33 per cent carbohydrates; Diabetiker Bretzel, 32 per cent proteids and 40 per cent carbohydrates.

Other biscuits (Fleur de Neige, Longuets, Madeleines and Exquis) are manufactured by the firm of Charrasse of Marseilles under the supervision of Dr. B. Charrasse, Officier d'Académie, Licencié ès Sciences, etc., and are stated to contain: Fleur de Neige, 29 per cent proteids and 22 per cent carbohydrates; Exquis, 24 per cent proteids and 36 per cent carbohydrates; Longuets, 15 per cent proteids and 64 per cent carbohydrates; Madeleines, 6 per cent proteids, 52 per cent carbohydrates, and 30 per cent fatty matters. The Diabetiker, Madeleine, and Exquis biscuits are sweetened with sugar substitutes, the other biscuits being unsweetened. All these preparations, particularly those made in Germany, are pleasant to take, and may be recommended where an absolutely starchless food is not considered essential. Messrs. Maurice & Co. selected these after a careful inspection of the various foods in use at the continental spas. They themselves manufacture the well-known "Brusson Jeune" gluten bread.

Digalen. Several forms of this drug—tablets and solutions for oral or hypodermic administration—have been sent us by the Hoffmann-La Roche Chemical Works Ltd. It is a sterile standardized solution of digitalis which enjoys a considerable vogue on the Continent. Various advantages are claimed for it over the ordinary preparations, and its virtues are at least sufficient to recommend it for a wider use than it has attained up till now in Britain. We should like to commend the neat little package in which ampoules of solution for hypodermic injection are sent out.

Digesto-Laxative Tabellæ (Sumner & Co., Liverpool) contain pepsin, pancreatin, diastase, gentian, aromatics, and $\frac{1}{4}$ gr. extract of cascara in each tablet—a combination which may be safely employed in many cases of chronic functional dyspepsia. They are sugar-coated and chocolate-flavoured.

Digitalin Tabloids, each containing gr. $\frac{1}{250}$ of the crystalline digitalin, have been sent us by Messrs. Burroughs, Wellcome & Co. Crystalline digitalin is in frequent use as a cardiac tonic; we are not convinced of its superiority over fluid preparations of digitalis, though it is asserted that it is less provocative of vomiting. The profession is timid in its use of digitalis; more harm is done by playing with it than by pushing it too far, and we trust that the makers of these small tabloids will find that physicians prescribe more than one or two per dose, as the label on the bottle suggests.

Digitalis Tincture, chemico-physiologically standardized, is sold by Mr. W. Martindale, whose researches into the question of digitalis standardization are well known, and this preparation embodies his belief in a chemical method available for use in small laboratories. His work is fully described in an interesting monograph on "Digitalis Assay," of which he has been kind enough to send us a copy.

Elixir Acetomorph. et Terpin; Elixir Heroin et Hyoscyam. (Reynolds & Branson, Leeds) are pleasant preparations for the relief of irritable cough.

Elixir Pepto-Bismuthi Conc. It is claimed by Messrs Sumner & Co., of Liverpool, that their preparation of these drugs is more effective than most of its kind because of its acidity; the usual alkaline combinations they argue require neutralization by the gastric hydrochloric acid before they can become active. One drachm is equivalent to liquor bismuthi dr. 1, tinct. nucis vom. 5 min., acid. hydrocyan. dil. 2 min., morphinæ hydrochlorid. gr. [illegible], pepsin gr. 1. We find that prolonged keeping does not precipitate the bismuth; and like so many of this firm's products, it is an elegant preparation.

Emetine, in highly soluble, non-irritating tablets of the hydrochloride (gr. ½ in each) is prepared by Messrs. Oppenheimer. This drug has leaped at one bound into the select group of specific remedies, thanks to the advocacy of our esteemed contributor, Dr. Leonard Rogers, of Calcutta; and we are glad to find all the reliable firms ready to meet the demand for the drug that is sure to arise in all lands where amœbic dysentery is rife.

Enules.—These suppositories, made by Messrs. Burroughs, Wellcome & Co., surely need no further introduction. A new one—containing epinine, a synthetic hæmostatic similar to suprarenal extract—has been added to the list. It is valuable in the treatment of rectal hæmorrhage from various causes. This firm has also favoured us with glycerine enules in a new packing, which protects them from the air while leaving them easily accessible.

Formaldehyde Inhalant. The revival of the inhalation treatment in laryngeal and pulmonary tuberculosis and other affections of the respiratory tract by Dr. D. B. Lees, has been responsible for a series of inhalants, each containing formalin in combination with various antiseptics and germicides. The ease with which formalin abstracts oxygen from organic matter probably accounts for its antiseptic efficiency; and being non-poisonous, non-corrosive, easy and clean in application, it is obviously an ideal antiseptic for internal application. The series prepared by Messrs. Oppenheimer consists of four inhalants suggested by Dr. C. Muthu, the author of "Pulmonary Tuberculosis and Sanatorium Treatment." Inhalant A contains pine oil, menthol, chloroform, etc., with formalin 2½, 5 or 10 per cent. Inhalant B contains pine oil, menthol, chloroform, etc., with formalin 5 per cent and guaiacol 12½ per cent. Inhalant C contains pine oil, menthol, chloroform, etc., with creosote 25 per cent, and terebene 12½ per cent. Inhalant D contains pine oil, menthol, chloroform, etc., with guaiacol 25 per cent, tr. iodi 12½ per cent, terebene 12½ per cent, etc. The inhalation treatment of these may be conducted by means of the Muthu formaldehyde inhaler, the aerizer, or universal vaporizer. A prominent feature of this treatment is that it may be continuously carried on wherever the patient is situated, a persistence which is necessary in order to produce amelioration of such diseases. The inhalants are issued in drop bottles each containing 1 oz.

Glycolactophos is one of the "nerve tonic" combinations of casein with glycerophosphates for which these neurotic days appear to provide a ready market. Messrs. Clay, Paget & Co. Ltd., of 71, Ebury Street, S.W., who are the makers, are at any rate to be congratulated on their candour, for the composition of their product is stated on the wrapper. It may be prepared for ingestion in a variety of ways, and its taste is pleasant. The name of the firm guarantees the genuineness of the product.

Glyphospher is a pleasant combination of glycerophosphates (calcium, sodium, manganese, iron) and strychnine, manufactured in Lyons and sold in this country by M. Bresillon & Co., Gamage Buildings, Holborn, E.C.

Helalin et Pepsin Co., Liq.—This combination is a hepatic stimulant and general digestive. It combines the antispasmodic, hepatic and sedative effect of helalin, the active principle of Collinsonia Canadensis, with the proteolytic power of a high-grade pepsin manufactured under the Witte process, for which the manufacturers of this product have the sole European rights. Obstinate cases of gonorrhœa, gleet, cystitis, etc., are said to have yielded to its influence, owing to the sedative effect of helalin on the mucous membrane. In gastro-intestinal catarrh, renal and biliary colic, intestinal indigestion and habitual constipation, excellent results are claimed. Issued in ¼lb. ½lb. or 1lb bottles, by Messrs. Oppenheimer, Son & Co., London.

Hipposarcine Roy, a liquid extract containing all the soluble proteids of the fresh muscle of the horse, claims to contain more protein, glycogen, hæmoglobin and organic iron, and less fat, than beef-extracts; in addition to which the danger of tuberculous infection, so prevalent in oxen, is avoided (surely rather a remote advantage). It is made in France and sold in England by M. Brésillon & Co. Indications are anæmia, tuberculosis, etc.

Iodéol (Viel) is a colloidal iodine for injection in pulmonary affections, hypertension, tuberculosis, chronic suppurations and so on. **Iodargol** is a more concentrated form of the same, for gonococcal infections. It may also be administered orally in gelatine capsules, and locally in the same way as tincture of iodine; it is less irritating and more easily absorbed than the latter. Various preparations have been sent to us by the British agents, Viel's Electric Colloids Co., 118–122, Holborn, E.C., who will be pleased to supply samples and literature to those interested.

Iodine Capsules (Mr. W. Martindale).—These consist of glass capsules containing iodine, and encased in cotton wool and silk; they are handy for use as a first dressing for wounds. Various sizes are sold.

Kepler Malt Extract with Glycerophosphates (calcium, potassium, sodium and magnesium) is now prepared by Messrs. Burroughs, Wellcome & Co. The use of the excellent Kepler Extract enhances the value of this familiar combination.

Kerol (Quibell Bros., Ltd., Newark) is a diphenyl derivative, sent out in three-minim gelatine capsules for internal administration as an intestinal antiseptic. Several papers calling attention to the value of this drug have already appeared in the journals, and we think it should commend itself to the profession as deserving of investigation.

Lacteol (Dr. Boucard's) is a Parisian preparation of lactic ferment in tablet form, sold by M. Brésillon & Co. The method of manufacture is not described in the literature we have received, but a wide list of clinical indications, chiefly gastro-intestinal, is given.

Lasophos is a new recruit to the apparently endless series of casein-glycerophosphate nerve tonic foods, prepared by the Medical Supply Association, 167–173, Gray's Inn Road, W.C. These compounds are useful under a variety of conditions; for instance, we have used them in convalescence from the acute infections and during the course of enteric fever.

Lymphatic Gland Tabloids.—A writer who recently investigated the incidence of enlarged tonsils and adenoids in children, states that in such condition there is a leucocytosis, but with diminution of the lymphocytes. Theoretically, he considers that the tonsillar enlargement is an attempt on the part of nature to increase the lymphoid tissue of the body. Working on this theory, he adopted a treatment for such cases, consisting of the administration of a preparation of lymphatic gland. He has applied this treatment in a number of cases, with the result that the snoring has been improved and the tonsils diminished in size. The dosage employed was gr. 5 thrice daily, and no bad effects were observed. The preparation used was that issued by Burroughs, Wellcome & Co. under the "Tabloid" brand, each tabloid representing gr. 5 of fresh gland substance.

Morphine Hypophosphite.—Messrs. Burroughs, Wellcome & Co. have added to their list "Tabloid" Hypodermic Morphine Hypophosphite, in products of four strengths. Morphine hypophosphite is a salt possessing qualities which render it particularly suitable for use in hypodermic medication when a concentrated solution is desired. It is perfectly stable, is practically neutral in reaction, and has the remarkable solubility of 1 in 3 of water. In clinical use its great solubility is a point of value, and it has been found to act well and promptly, without causing pain at the point of injection. The gr. ¼ and gr. ⅓ strengths are issued in tubes of 20, and the gr. ½ and gr. 1 strengths in tubes of 12.

Omnopon is a preparation noticed by us in a previous issue. We call attention to it once more because it deserves wider recognition in this country. Sold on the Continent as "pantopon," it has gained considerable vogue. It contains all the alkaloids of opium, and may be given orally or hypodermically wherever opium is indicated; many of the drawbacks of opium and morphia are avoided by its use. An interesting paper on its general employment appeared in the *Medical Press and Circular*, September 17th, 1913. In combination with scopolamine it may be used to induce narcosis for operations or obstetrical work; ampoules of this combination are issued in a very neat package by the Hoffmann-La Roche Chemical Works Ltd., Idol Lane, E.C.

"Oscol" Tampons (Oppenheimer, Son & Co. Ltd.) consist of sterilized cotton wool impregnated with suprarenal principle (renaglandin), and enclosed in a soluble gelatine capsule which renders it readily portable. It is destined for use in various types of uterine hæmorrhage. Boxes of six cost 4/-.

Ozoline (Messrs. Oppenheimer, Son & Co. Ltd.) is a soothing prophylactic cream containing an antiseptic and deodorant which acts by the liberation of nascent oxygen and the subsequent formation of innocuous compounds; it is destined for use as a dressing in obstetrics and general surgery.

Paracodin (Messrs. Knoll & Co. Ltd., London, E.C.) is a new codeia preparation alluded to in the index of new remedies in the current volume.

Parofex, prepared by Messrs. Reynolds & Branson of Leeds, is an excellent form of paraffin for internal administration. It is pleasantly coloured and flavoured, and is therefore particularly adapted for giving to children. Of the virtues of paraffin in intestinal disorders associated with stasis it is impossible to speak too highly, and this product may be recommended as an admirable mode of administering it.

Perogen Bath Salts, sent out in packets each of which supplies enough to yield one bath, are designed for the ready preparation of a nascent effervescing oxygen bath. For further information and literature, practitioners should write to Messrs. A. & M. Zimmermann, 3, Lloyd's Avenue, E.C.

Petremol is another excellent liquid paraffin preparation sold by Messrs. Oppenheimer, Son & Co. Ltd., who claim exceptional purity as one of its chief virtues.

Phylacogens (Parke, Davis & Co.) are sterile aqueous solutions of modified bacterial derivatives prepared according to the process of Dr. A. A. Schafer, of California. There are five distinct varieties, viz., mixed infection, erysipelas, gonorrhœa, pneumonia and rheumatism phylacogens.

The mixed infection phylacogen is a polyvalent preparation obtained by the culture in approximately equal proportions of a wide variety of pathogenic bacteria, such as the several *staphylococci*, *streptococcus pyogenes*, *bacillus pyocyaneus*, *bacillus diphtheriæ*, *diplococcus pneumoniæ*, *bacillus typhosus*, *bacillus coli communis*, *streptococcus rheumaticus* and *streptococcus erysipelatis*, numerous strains of each organism being employed. Mixed infection phylacogen also forms the basis of the other varieties, being modified by the addition of a predominating proportion of metabolic substances obtained from the culture of the organism considered to be paramount in the pathological condition for which the respective phylacogen is to be used. It is Dr. Schafer's belief that the symptoms developed during the course of an infectious disease are due not only to the effects of a single species of organism (the specific infection), but to the influence of other organisms which must be taken into account in any mode of treatment which is to be successful.

The phylacogens are administered subcutaneously or intravenously. We have had some little personal experience of the phylacogens, but hesitate to pronounce any opinion. It is obvious that so sweeping a generalization as that on which this new therapeutic venture is based calls for careful and prolonged testing before it can receive general acceptance. No doubt this testing will be applied, and the published reports (which are already numerous) will be available for the profession to form an opinion upon.

Pini Sed., Ung. A new antipruritic ointment by Reynolds & Branson of Leeds. One advantage is its freedom from grittiness—a fault we have noted in one or two ointments of this class.

Pneumosan is a drug which is offered by the Pneumosan Chemische Fabrik, 132, Great Portland Street, W., as a remedy for pulmonary and other forms of tuberculosis. It is a combination of methylene blue, valeric acid, and codeine, which is said to act by destroying the bacilli. It is administered by intramuscular injection. Several British clinicians have reported favourably as to its value. Our own experience is at present limited to one advanced case; here undoubted though temporary benefit followed its administration. The fact that it is administered by intramuscular injection militates against a wide application, as patients are apt to object to it, however painless it may be. However, we hope to have opportunity for a thorough test of this remedy.

Polylactol (The Bayer Co., 19, St. Dunstan's Hill, E.C.) is destined for use as a galactagogue, a purpose it is said to have realized with gratifying success. It is a compound of somatose, organic iron, maltose, and galactose. A 3/- bottle lasts ten days to a fortnight, so it is not a costly remedy.

Propaesin is a new local anaesthetic, sold by B. Kuhn & Co., 16, Rood Lane, E.C. Chemically it is a para amido-benzoic acid propyl-ester. It has been carefully tested, and appears to be innocuous. The rapid action, even in small quantity, on the mucous surface of the tongue, is remarkable. It may be applied to a painful stomatitis in the form of pastilles, or as an ointment to painful ulcerations of the skin. Other applications will no doubt suggest themselves to the practitioner, who will, we think, find this substance worthy of notice. The manufacturers supply literature explaining the pharmacology of the drug.

Pulverettes.—By a really admirable device Messrs. Oppenheimer have enclosed powders in a frail chocolate and sugar shell which dissolves in the mouth. It is so light that it can be crushed between finger and thumb. The disadvantages inherent in pill and tablet medications are thus avoided to a great extent. Many drugs have been put up for administration in this way, and the makers are prepared to embody the practitioner's private formula in the same vehicle.

Roboleine (also an Oppenheimer product) is composed of red bone marrow, cream of malt, and hypophosphites. It may be taken "neat" or with milk or other foods, and affords an efficient and palatable substitute for cod liver oil.

Sapokrol (Messrs. Reynolds & Branson, Leeds), a germicide, disinfectant and antiseptic, is a saponified solution of meta- and other cresols, which are more active and less caustic antiseptics than phenol. Sapokrol does not coagulate albumin nor corrode instruments, forming a clear solution, on dilution, with hot or cold water, in any proportions. A pathologist reports that "a 1 per cent solution with distilled water kills a very active emulsion of typhoid bacilli in 2½ minutes." Owing to the solvent action of Sapokrol on mucus, etc., it is particularly useful as a cleansing agent for sputum flasks, etc. Directions for use:—For general disinfecting purposes, one tablespoonful to one pint of water—approximately 3 per cent solution. For disinfecting the hands or instruments, one dessertspoonful to one pint of water—approximately 1½ per cent solution. For douching or irrigation purposes, and for the treatment of wounds, one teaspoonful to one pint of water—about 1 per cent solution. An aluminium measure marked in teaspoons is supplied with each bottle.

Scarlet Red Ointments have come to stay. We welcome two new brands, the "Ung. Bietrich" (5 per cent) of Messrs. Oppenheimer, and Messrs.

Sumner & Co.'s 10 per cent scarlet red with erythemol ointment. This latter provides an excellent base for the scarlet red, and the combination is a reasonable one.

Secacosnin is a sterile ergot extract, which seeks to embody all the active principles while eliminating the harmful constituents. It is physiologically standardized, and being sterile, may be used for injections as well as for oral administration. (Hoffmann-La Roche Chemical Works, Ltd.)

Sennax (Knoll & Co.) contains the water-soluble glucoside of senna leaves isolated from the crude drug by a patented process. A reliable product sent out in powder, solution, or tablet form.

Thigenol (Hoffmann-La Roche Chemical Works, Ltd.) is a sulpho-oleate containing 2·5 per cent of organically fixed sulphur. It is a dark brown syrupy liquid, almost odourless, which does not permanently stain linen. In skin diseases it may be applied to relieve irritation; it forms, when dry, a non-adhesive covering on the skin. The makers have sent us a pleasant soap containing 10 per cent of this compound.

Thiocol, from the same firm, is a guaiacol compound put up in powder form, in a syrup, and in tablets. The indications for its use are those of guaiacol.

Thyroidectomised Horse Serum (Parke, Davis & Co.).—This serum, from the blood of horses which have been deprived of the thyroid gland, is administered in cases of exophthalmic goitre, on the assumption that it is rich in substances which in normal animals combine with thyroid secretion in the blood and prevent the occurrence of thyroid intoxication. It may be given orally in doses of from 1 to 5 c.c. every two or three days, or from 0·5 to 1 c.c. may be injected subcutaneously.

Tuberculins.—There is no need to say more about the purchase of tuberculin for therapeutic purposes than that any form of this medicament can be procured in any dose from any of the principal firms. Among "appliances" we have noticed a syringe for administration of tuberculin made by Messrs. Burroughs, Wellcome & Co. The same firm have sent us particulars of a "tabloid" tuberculin dilution outfit. From their account we learn that the whole equipment packs into an aluminized case measuring [illegible] by 2½ by 1½ inches; in spite of these modest dimensions, the outfit is evidently easy to manage accurately. Messrs. Sumner, of Liverpool, have favoured us with a neat little outfit, with full directions, for carrying out a quantitative tuberculin diagnostic inoculation, the reaction to which yields information of prognostic as well as diagnostic value (see paper by Dr. E. C. Morland, *Lancet*, 1912, volume ii., page 68).

Tylcalsin and Tyllithin, names dimly reminiscent of the "Blue Bird," emanate from Mr. W. Martindale. They are soluble aceto-salicylates of calcium and lithium respectively, and may be used for easing the various pains to which the term "rheumatic" is applied.

Vaccines.—Messrs. Parke, Davis & Co. inform us that they have added to their list of "stock" preparations vaccines for treatment of actinomycosis, malta fever, typhoid fever, and the all too common cold. The list of organisms included in this latter contains seven distinct varieties. We are also reminded that Mr. W. Martindale represents the [illegible] Institute in the sale of vaccines, and that this institute makes a special feature of sensitized vaccines, an account of which appears in the first part of this volume.

Yellow Oxide of Mercury Ointment (Parke, Davis & Co.) is specially suitable for ocular medication, being prepared from freshly-precipitated yellow mercuric oxide by a process which produces an ointment that is perfectly free from grittiness. The small tubes of pure tin in which the ointment is supplied are very convenient for the patient's use; they are furnished with elongated nozzles which facilitate the introduction of a small quantity of the ointment on to the inner surface of the everted eyelid.

BOOKS OF THE YEAR.

A LIST OF THE PRINCIPAL MEDICAL WORKS AND NEW EDITIONS PUBLISHED DURING 1913.

For the convenience of our readers any of the works in this list can be obtained from Messrs. John Wright & Sons Ltd., "Medical Annual" Offices, Bristol.

AMBULANCE AND NURSING.

Anatomy for Nurses. By E. M. Bundy. 2nd ed. 215 Illus. *Churchill* *Net 7s. 6d.*

Anatomy and Physiology for Nurses. By Le Roy Lewis. 3rd ed. *Saunders* *Net 8s.*

Applied Bacteriology for Nurses. By C. F. Bolduan and M. Gründ. *Saunders* *Net 6s.*

Bandaging Made Easy. By M. R. Hosking. 16mo, pp. 110. *Scientific Press* *Limp, Net 1s.*

British Red Cross Society's First Aid Manual. By James Cantlie. No. 1. 2nd ed. *Cassell* *Net 1s.*

Compendium of Aids to First Aid. By N. Corbet Fletcher. With an Introduction by James Cantlie. *Bale* *Net 6d.*

Course of Lectures on Medicine to Nurses. By Herbert E. Cuff. 6th ed. Cr. 8vo, pp. 292. *Churchill* *Net 3s. 6d.*

Elementary Clinical Pathology for Nurses. By Geo. Herschell and R. Weiss. 2nd ed. *Churchill* *Net 1s.*

Explanatory Lectures for Nurses and their Teachers. By H. Hawkins-Dempster. Illustrated by Coloured Plate and numerous Illustrations in the text. Demy 8vo, 240 pp. *J. Wright & Sons Ltd.* *Net 3s. 6d.*

"First Aid" to the Injured and Sick. By F. J. Warwick and A. C. Tunstall. An Ambulance Handbook. 8th ed., revised. 12mo, pp. 262. *J. Wright & Sons Ltd.* *Boards, Net 1s.*

History of Nursing, A. Edited by L. L. Dock. Vols. III. and IV. 8vo. *Putnam* *Net 21s.*

How to Succeed as a Trained Nurse. By Sir Henry Burdett. Cr. 8vo, pp. 200. *Scientific Press* *Net 2s. 6d.*

The Indian Manual of First Aid. By R. J. Blackham. 18mo. *Thacker* *Boards, Net 1s. 6d.*

Invalid and Convalescent Cookery. By Mary E. Birt. 2nd ed. 16mo. *J. Wright & Sons Ltd.* *Sewed, Net 6d.*

Manual of Ambulance. By J. Scott Riddell. 6th ed. Cr. 8vo, pp. 270. *C. Griffin* *Net 6s.*

Manual for Women's Voluntary Aid Detachments. By P. C. Gabbett. 2nd ed., revised and enlarged. 16mo, pp. 116. *J. Wright & Sons Ltd.* *Limp, Net 1s.*

Maternity Nursing. By Sarah Macdonald. Cr. 8vo, pp. 216. *Methuen.* *Net 3s. 6d.*

Medicine for Nurses and Housemothers. By G. H. Hoxie and Pearl Laptad. 2nd ed. *Saunders* *Net 6s. 6d.*

Nurse's Duties Before and During Operations. By E Margaret Fox. 16mo. *Scientific Press* *Limp, Net 1s.*

Nursery Notes for Mothers. By C. Willett Cunnington. Cr. 8vo. Pp. 148. *Baillière* *Net 2s. 6d.*

Nursing of Nervous Patients. By Edwin L. Ash. Cr. 8vo, pp. 122. *Scientific Press* - - - - - - - *Net* 2s. 6d.

Obstetric and Gynecologic Nursing. By E. P. Davis. 4th ed. *Saunders* *Net* [illegible]

Obstetrics for Nurses. By J. B. De Lee. 4th ed. *Saunders* *Net* 12s.

Pathology and Bacteriology for Nurses. By Jay G. Roberts. *Saunders* *Net* 6s.

Plan of Clearing Hospital, 100 Beds, with Complete Inventory. Arranged for the Guidance of Voluntary Aid Detachments. 12mo. *Simpkin* - - - - - - *Sewed, Net* 6d.

Practical Nursing. By Isla Stewart and H. E. Cuff. 4th ed., thoroughly revised and enlarged. Cr. 8vo, pp. 458. *W. Blackwood* - *Net* 5s.

Private Duty Nursing. By K. de Witt. Cr. 8vo. *Lippincott.* *Net* 5s.

Problems in First Aid. By L. M. F. Christian and W. R. Edwards. 16mo, pp. 176. *St. John Ambulance Assoc.* - *Limp, Net* 6d.

Short Practice of Midwifery for Nurses. By Henry Jellett. 4th ed., revised. 6 Plates, 169 Illus. Cr. 8vo, pp. 524. *Churchill* *Net* 7s. 6d.

Voluntary Aid Detachments in Campaign. By C. R. S. Bradley. 12mo. *Harrison* - - - - - - - *Net* 1s. 6d.

ANATOMY AND PHYSIOLOGY.

Anatomical Charts. By — Piersol. Set of 50. 12s. 6d. *per Chart for set.*

Anatomy, Descriptive and Applied. By Henry Gray. 18th ed. Edited by Robert Howden. Illus. Roy. 8vo, pp. 1328. *Longmans* *Net* 32s.

Anatomy and Physiology of the Fifth Cranial or Trigeminal Nerve and of its Ganglia and Connections. By L. H. Pegler. Chart printed in colours, mounted on roller, 48in. by 60in. *Net* 21s.; In cloth cover, mounted on linen, with text. *Baillière* - - - *Net* 25s.

Comparative Anatomy of Vertebrates. By J. S. Kingsley. Illus. Demy 8vo. *J. Murray* - - - - - *Net* 12s.

Companion to Manuals of Practical Anatomy. By E. B. Jamieson. 12mo, pp. 332. *Frowde* - - - - - *Net* 6s.

Course in Normal Histology. By Rudolf Krause. A Guide for Practical Instruction in Histology and Microscopic Anatomy. Only authorized Translation by P. J. R. Schmahl. In two parts. 98 Coloured Plates and 30 Illus. Imp. 8vo. *Heinemann* *Part I. Net* 8s.; *Part II.* 25s.

Cunningham's Text Book of Anatomy. Edited by Arthur Robinson. 4th ed., enlarged and rewritten. Roy. 8vo, pp. 1622. *H. Frowde.* *Net* 31s. 6d.

Handbook of Physiology. By W. D. Halliburton. 11th ed. Cr. 8vo, pp. 944. *J. Murray* *Net* 15s.

Histological Studies on the Localization of Cerebral Function. By Alfred W. Campbell. Medium 4to. With 29 Plates and 23 Text-figures. *Cambridge University Press* *Net* 18s.

Human Body, Its Muscles, its Organs, its Skeleton. 8vo. *Ewart, Seymour* - - - - - - - *Net* 1s. 6d.

Human Embryology and Morphology. By Arthur Keith. 3rd ed., revised and enlarged. Demy 8vo, pp. 454. 442 Illus. *E. Arnold* *Net* 15s.

Human Physiology. By Luigi Luciani. Vol. II. Illus. Demy 8vo, pp. 596. *Macmillan* - *Net* 18s.

Introduction to Biology. By M. A. and A. N. Bigelow. Cr. 8vo. *Macmillan* - - - - - - - 9s.

Manual of Anatomy. By A. M. Buchanan. New ed. 8vo. 1 Vol. *Baillière* *Complete Net* 21s.; *Vols. I. and II., each Net* 12s. 6d.

Normal Histology. By — Piersol. 10th ed. 8vo. *Lippincott* *Cloth Net* 15s.

Pocket Anatomy. 7th ed., revised and Edited by C. H. Fagge. 32mo. pp. 311. *Baillière* - - - - - *Net* 3s. 6d.

Problems of Life and Reproduction. By Marcus Hartog. Illus. Demy 8vo. *J. Murray* - - - *Net* 5s. 6d.

Text-book of Anatomy. By D. J. Cunningham. 4th ed. *H. Frowde* *Net* 31s. 6d.

Text-book of Biology. By W. M. Smallwood. Roy. 8vo. pp. 285. 13 Coloured Plates and 243 Illus. *Baillière* - - *Net* 10s. 6d.

Text-book of Physiology. By Isaac Ott. 4th ed., revised and enlarged. 8vo. *S. Phillips* - - - - - - *Net* 14s. 6d.

Text-book of Physiology. By W. H. Howell. 5th ed. *Saunders* *Net* 18s.

Vertebrate Embryology. By J. W. Jenkinson. Comprising the Early History of the Embryo and its Fœtal Membranes. Demy 8vo, pp. 268. *H. Frowde* - - - - - - - *Net* 12s. 6d.

The Vertebrate Skeleton. By S. H. Reynolds. 2nd ed. Demy 8vo. 144 Illus. *Cambridge University Press* - - - *Net* 15s.

BACTERIOLOGY.

Abel's Laboratory Handbook of Bacteriology. 2nd English ed., pp. 264. *H. Frowde* - - - - - *Net* 5s.

Bacteria. By — Schottelius. 2nd ed. *H. Frowde* - - *Net* 8s. 6d.

Bacteriology. Part II. 2nd ed. *Catechism Series.* Cr. 8vo, pp. 84. *Livingstone* - - - - - - *Sewed, Net* 1s.

Bacteriology of Diphtheria. By Various Writers. Reissue, with Supplementary Bibliography. Roy. 8vo. *Cambridge University Press* *Net* 15s.

Compend on Bacteriology, including Animal Parasites. By Robert L. Pitfield. 2nd ed. With 4 Plates and 85 other Illus. Cr. 8vo, pp. 286. *Oxford University Press* - - - - - *Net* 5s.

Diagnosis of Bacteria and Blood-Parasites. By E. P. Minett. 2nd ed. 12mo, pp. 88. *Baillière* - - - - *Net* 2s. 6d.

Elementary Bacteriology and Protozoology. By H. Fox. Cr. 8vo. 5 Coloured Plates and 67 Illus. *Churchill* - - - *Net* 6s. 6d.

Elements of Bacteriological Technique. By J. W. H. Eyre. 2nd ed. *Saunders* - - - - - - - - *Net* 13s.

Household Bacteriology. By E. D. and R. E. Buchanan. For Students in Domestic Science. Cr. 8vo. *Macmillan* - - *Net* 10s.

Laboratory Guide to Parasitology. By W. B. Herms. 8vo. *Macmillan* - - - - - - - *Net* 3s. 6d.

Manual of Bacteriology. By Robert Muir and James Ritchie. 6th ed. Cr. 8vo, pp. 760. *Frowde* - - - - - *Net* 10s. 6d.

Medical Bacteriology and Protozoology. Part I. 2nd ed., enlarged and revised. *Catechism Series.* Cr. 8vo, pp. 82. *Livingstone* *Sewed, Net* 1s.

Practical Bacteriology, Blood Work and Animal Parasitology. By E. R. Stitt. 3rd ed., revised and enlarged. 4 Plates and 106 Illus. Cr. 8vo, pp. 426. *H. K. Lewis* - - - - *Net* 6s. 6d.

Practical Bacteriology, Microbiology, and Serum Therapy: Medical and Veterinary. By A. Besson. A Text-book for Laboratory Use. Roy. 8vo, pp. 922. *Longmans* - - - - *Net* 36s.

Vaccine and Serum Therapy. By E. H. Schoror. 2nd revised ed. Roy. 8vo, pp. 316. Illus. *Kimpton* - - - - *Net* 12s. 6d.

CANCER.

Cancer of the Breast. By C. B. Lockwood. An Experience of a Series of Operations and their Results. Demy 8vo, pp. 234. *Oxford University Press* - - - - - - *Cloth, Net* 10s. 6d.

Cancer, its Cause and Treatment without Operation. By Robert Bell. 2nd ed., revised. Cr. 8vo, pp. 336. *Bell* - - *Net* 5s.

Cancer Hospital Research Institute. Vol. I.—Selected Papers. Edited by Alexander Paine. Imp. 8vo. *Adlard* - - - *Net* 12s. 6d.

Cancer: The Problem of its Genesis and Treatment. By F. W. Forbes Ross. Demy 8vo. *Methuen* - - - *Net* 5s.

Cancer of the Rectum, its Surgical Treatment. By H. Cripps. 6th ed. 8vo. *Churchill* - - - - - *Net* 5s.

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Studies in Cancer and Allied Subjects. Vols. I and III. 4to. *H. Frowde* - - - - - - *Each, Net.* 21s.

CHEMISTRY AND PHYSICS.

The Chemical Constitution of the Proteins. By R. H. A. Plimmer. Part 2. 2nd ed., revised. Roy. 8vo. *Longmans* - - *Net* 3s. 6d.

Dictionary of Applied Chemistry. By Sir Edward Thorpe. Vol. IV. Oilstone-Soda Nitre. Revised and enlarged ed. Illus. Roy. 8vo. *Longmans* - - - - - - - *Net* 45s.

General Chemistry Laboratory Manual. By J. C. Blake. 8vo. *Macmillan* - - - - - - - *Net* 8s.

Manual of Clinical Chemistry, Microscopy, and Bacteriology. By M. Klopstock and A. Kowarski. 2nd ed. Demy 8vo, pp. 371. 16 Coloured Plates and 43 Illus. *Heinemann* - - *Cloth,* 12s. 6d.

Manual of Pharmacology. By Walter E. Dixon. 3rd ed., revised. Illus. Demy 8vo, pp. 404. *E. Arnold* - - - *Net* 15s.

Organic Chemistry for Students of Medicine. By James Walker. Demy 8vo, pp. 340. *Gurney & Jackson* - - - *Net* 6s.

Practical Chemistry. By J. C. Brown. 6th ed. Edited by G. D. Bengough. 8vo. *Churchill* - - - - - *Net* 2s. 6d.

Practical Physiological Chemistry. By Sydney W. Cole. Cr. 8vo, pp. 242. *W. Heffer* - - - - - *Net* 7s. 6d.

Qualitative Analysis of Medicinal Preparations. By H. C. Fuller. Cr. 8vo. *Chapman & Hall* - - - *Net* 6s. 6d.

Refraction and Dispersion of the Halogens, Halogen Acids, Ozone, Steam, Oxides of Nitrogen and Ammonia (Royal Society). By C. and M. Cuthbertson. 4to, pp. 26. *Dulau* Sewed, *Net* 1s. 6d.

CHILDREN'S DISEASES AND INFANCY.

Babies. By Margaret French. A Book for Maternity Nurses. 12mo, pp. 77. *Macmillan* - *Limp, Net* 1s.

Birch's Management and Medical Treatment of Children in India. 5th ed. Cr. 8vo. *Thacker* - - - *Net* 10s. 6d.

Book for Mothers on the Management of Children in Health and Disease. By A. M. Usher. Cr. 8vo, pp. 118. *Churchill* Sewed, *Net* 1s.

Care of Children. By R. J. Blackham. Practical Hints for Mothers and Nurses at Home and Abroad. 3rd ed. Cr. 8vo, pp. 114. *Scientific Press* - - - *Boards, Net* 2s. 6d.

Care and Feeding of Children. By L. E. Holt. 6th ed. *Appleton* *Net* 2s.

Diseases of Children. By John McCaw. A Manual for Students and Practitioners. Cr. 8vo, pp. 550. 14 Plates and Illus. *Baillière* *Net* 10s. 6d.

Diseases of Children. By Sir James Frederic Goodhart. 10th ed. Edited and revised by George Frederick Still. Demy 8vo, pp. 990. *Churchill* *Net* 15s.

Diseases of Children. By H. E. Tuley. 2nd revised ed. Roy. 8vo. 5 Coloured Plates, 100 Engravings. *Kimpton* - - *Net* 24s.

Diseases of Children. By Various Authors. Edited by Archibald E. Garrod. Fully Illus. Pp. 1200. E. Arnold - Net 30s.

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Hygiene of the Nursery. By Louis Starr. 8th ed., with 26 Illus. Cr. 8vo, pp. 342. *H. K. Lewis* - - - - *Net* 3s. 6d.

Infant Care and Management. By Edith L. Maynard. Cr. 8vo, pp. 122. *E. Arnold* - - - - - - *Net* 1s. 6d.

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Anatomy and Histology of the Mouth and Teeth. By I. N. Bromell. 4th ed., revised. Roy. 8vo. *H. Kimpton* - - - *Net* 12s. 6d.

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Featherstone Hall, Southall (for ladies). Res. Med. Lic., W. H. Bailey, M.D. Access—Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streatham Hill. Res. Med. Supt., J. H. Earls, M.D. Access—Tulse Hill, or Streatham Hill, 5 minutes.

Flower House, Catford, S.E. Res. Med. Supt., Dr. C. C. Bullmore. Access—C. & D. R., Beckenham Hill, 5 minutes.

Halliford House, Sunbury-on-Thames, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Access—Sunbury station, 1¼ miles.

Hayes Park (for ladies), Hayes, Middlesex. Res. Med. Off., Dr. J. W. Higginson. Access—Hayes, 2 miles.

Hendon Grove Asylum (for ladies), Hendon. Med. Lic., H. L. de Caux, L.S.A. Access—By M.R., Hendon station, ½ mile, or 'bus from Tube at Golder's Green. *See also p.* 892

London County Asylum, Banstead Downs, near Sutton, Surrey. Res. Med. Supt., Dr. P. C. Spark. Access—Belmont station, ½ mile; Sutton station, 1½ miles.

London County Asylum, Bexley, Kent. Res. Med. Supt., T. E. K. Stansfield, M.B. Access—Bexley station, 1¼ miles.

London County Asylum, Cane Hill, Coulsdon, Surrey. Res. Med. Supt., Sir J. M. Moody. Access—Coulsdon, S.E.R., or Coulsdon and Smitham Downs, L.B. & S.C.R., 10 minutes.

London County Asylum, Claybury, Woodford Bridge, Essex. Res. Med. Supt., Robert A. Jones, M.D. Access—Woodford Bridge station, G.E.R., 1½ miles.

London County Asylum, Colney Hatch, N. Res. Med. Supt., S. J. Gilfillan, M.A., M.B. Access—New Southgate, G.N.R.

London County Colony (for Insane Epileptics), Ewell, Epsom. Res. Med. Supt., Dr. M. A. Collins. Access—L. & S.W. & L.B. & S.C.R. stations, 1½ miles.

London County Asylum, Hanwell. Res. Med. Supt., Dr. P. J. Baily.

London County Asylum, Horton Epsom. Res. Med. Supt., Dr. J. R Lord. Access—L. & S.W. Rly., 1½ miles, L.B. & S.C.R., 1¾ miles

London County Asylum, Long Grove, Epsom. Res. Med. Supt., D. Ogilvy, M.D. Access—L. & S.W.R. and L.B. & S.C.R.

London County Asylum, The Manor, Epsom. Res. Med. Supt., W. Ireland Donaldson, M.D. Access—L. & S.W. and L.B. & S.C.R.

Middlesex County Asylum, Tooting, S.W. Med. Supt., R. Worth, M.B., B.S. Access—Wandsworth Common station, 1 mile.

Moorcroft House, Hillingdon, Uxbridge, 2 miles. Med. Licensees. Dr. R. J. Stilwell, and Dr. R. H. Cole. Access — West Drayton station, 2 miles

Newlands House, Tooting Bec Common, S.W. (for gentlemen). Prop. and Res. Phys., Dr. J. Noel Sergeant. Access—Balham station, 1 mile, & motor bus. *See also p.* 900

Northumberland House, Green Lanes, N. Res. Med. Supt., Bernard Hart, M.D. Access—Finsbury Park station, 1 mile. *See also p.* 898

Otto House, 47, North End Road, West Kensington (for ladies). Lic. Prop., A. H. Sutherland. Lady Supt., Mrs. Chapman. Access—West Kensington station, 1 mile; Barons Court station (Piccadilly Tube), 1 mile. *See also p.* 900

Peckham House, 112, Peckham Road, S.E. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Access—Peckham Rye station, 10 minutes' walk. *See also p.* 897

St. Luke's Hospital, Old St., E.C. Res. Med. Supt., Wm. Rawes, M.D., F.R.C.S. Convenient to principal London stations. *See also p.* 897

The Grange, East Finchley, N. Res. Licensees, Dr. F. and Mrs. Watson.

The Priory, Roehampton, S.W., near Richmond Park. Res. Med. Supt., James Chambers, M.D. Access—Barnes station, 10 mins.

West Ham Boro' Asylum, Goodmayes, Ilford. Res. Med. Supt., Dr. L. F. Hanbury. Access—Goodmayes, ¾ mile.

Wood End House, Hayes (ladies). [illegible] miles. Med. Lic., Dr. H. Stilwell. Access—Hayes station, 1 mile.

Londonderry.—*District Asylum.* Res. Med. Supt., Dr. Hetherington. Access—Londonderry, 1 mile.

Macclesfield.—*Parkside Asylum.* Res. Med. Supt., J. C. McConaghey, M.D. Also *Uplands*, a large detached villa for private patients. Access—Macclesfield, 1 mile. *See also p.* [illegible]

Maidstone.—*Kent County Asylum.* Res. Med. Supt., H. W. Lewis, M.D. Access—Maidstone, 1½ miles.

West Malling Place, Kent. Res. Med. Supt., Dr. G. H. Adam. Access—Malling station, 1 mile. *See also p.* [illegible]

Market Lavington (Wilts).—*Fiddington House.* Prop., Major Reilly. Res. Med. Supt., Dr. J. Selfe Lush. Access—Lavington, 1½ miles.

Maryborough (Queen's County).—*District Asylum.* Res. Med. Supt. Dr. P. Coffey. Access — Maryborough, ½ mile.

Melrose, N.B. — *Roxburgh District Asylum.* Res. Med. Supt., J. C. Johnstone, M.D. Access—Melrose, 1 mile.

Melton. — *Suffolk District Asylum*, near Woodbridge. Res. Med. Supt., J. R. Whitwell, M.B. Access—Melton station, 1¼ miles; Woodbridge station, 2¼ miles.

Middlesbro'.—*County Boro' Asylum.* Res. Med. Supt., Dr. J. W. Geddes. Access—Middlesbro', 2 miles.

Monaghan (Ireland).—*District Asylum.* Res. Med. Supt., Dr. T. P. Conlon. Access—Monaghan, ¼ ml.

Montrose, N.B. — *Montrose Royal Lunatic Asylum.* Phys. Supt., John G. Havelock, M.D. Access—Hillside, ¼ mile; Dubton, 1 mile.

Morpeth. — *Northumberland County Asylum.* Res. Med. Supt., Thos. W. McDowall, M.D. Access—Morpeth station, 1 mile, by 'bus.

Mullingar. — *District Asylum.* Res. Med. Supt., Dr. Laurence Gavin. Access—Mullingar station, 1 mile.

Newcastle-on-Tyne.—*City Asylum.* Gosforth. Res. Med. Supt., James T. Callcott, M.D. Access—Newcastle, 4 miles.

Northampton.—*Berrywood Asylum.* Res. Med. Supt., W. Harding, M.D. Access—Castle station, 2¼ miles; Midland station, 3 miles.

St. Andrew's Hospital, Northampton. Med. Supt., D. F. Rambaut, M.A., M.D. (T.C. Dub.) Access—Northampton station, 1 mile. *See also p.* [illegible]

Norwich.—*Bethel Hospital for Mental Diseases.* Res. Med. Supt., S. J. Fielding M.B. Cons. Phys., Saml. J. Barton, M.D. Access—Norwich (Thorpe) station, 1 mile. *See also p.* [illegible]

Heigham Hall, Norwich. Res. Med. Prop., J. G. Gordon-Munn, M.D. Access—Victoria station, 1 mile; Thorpe station, 1½ miles.

Norfolk County Asylum, Thorpe, Norwich. Res. Med. Supt., D. G. Thomson, M.D. Access—Whitlingham, 1 mile; Norwich, 2½ miles.

Norwich City Asylum, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Access—Hellesdon, 1 mile.

The Grove, Old Catton, near Norwich (for ladies.) Res. Med. Supt., C. A. Osburne, F.R.C.S. Apply to the Misses McLintock.

Nottingham.—*City Asylum*, Mapperley Hill. Med. Supt., E. Powell, M.R.C.S.

Notts County Asylum. Res. Med. Supt., S. L. Jones, M.R.C.S. Access—Radcliffe-on-Trent, 2 miles.

The Coppice. Res. Med. Supt., David Hunter, M.B. (Camb.). Access—Midland station, 2½ miles; Gt. Northern & Gt. Central station, 1½ miles. *See also p.* 902

Omagh.—*District Asylum.* Res. Med. Supt., Dr. P. O'Doherty. Access—Omagh station, 1½ miles.

Oxford.—*County Asylum*, Littlemore. Res. Med. Supt., T. S. Good, M.R.C.S. Access—Littlemore station.

The Warneford, Oxford, 1½ miles. Res. Med. Supt., James Neil, M.D. Access—Oxford station, 2¼ miles. *See also p.* 903

Paisley.—*Lunatic Ward*, Poorhouse, Craw Road. Res. Med. Off., Winifred M. Ross, M.B., Ch.B. Access—Paisley, 1 mile.

Paisley District Asylum, Riccartsbar. Med. Off., D. Fraser, M.D. Access—Paisley West, ¼ mile.

Perth.—*District Asylum*, Murthly. Res. Med. Supt., Lewis C. Bruce, M.D. Access—Murthly.

James Murray's Royal Asylum, Perth (for private patients only). Phys. Supt., R. Dods Brown, M.D., F.R.C.P. Ed. Access—Perth station, under 2 miles. *See also p.* 901

Plympton. — *Plympton House*, Plympton, South Devon. Res. Props., Dr. Alfred Turner and Dr. J. C. Nixon. Access—Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles. *See also p.* 900

Portsmouth.—*Borough Asylum.* Res. Med. Supt., B. H. Mumby, M.D., D.P.H. Access—Fratton, 1½ miles. *See also p.* 892

Prestwich (nr. Manchester).—*County Asylum.* Res. Med. Supt., Dr. F. Perceval. Acc.—Prestwich, ¾ mile.

Rainhill (near Liverpool).—*County Asylum.* Res. Med. Supt., T. P. Cowen, M.D. Access—St. Helens, 2½ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange*, 5 miles from Sheffield (for ladies). Con. Phys., W. C. Clapham, M.D. Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Access—Grange Lane station, G.C.R., ½ mile. *See also p.* 903

St. Albans (Hill End).—*Herts County Asylum.* Med. Supt., A. N. Boycott, M.D. Access—Hill End station, G.N.R., 2 minutes.

St. Leonards-on-Sea.—*Ashbrook Hall*, Hollington (for ladies). Res. Lics., Mr. and Mrs. Charles Somerset. Med. Off., Dr. Wm. E. Peck. Access—Warrior Square stat., 2 miles. *See also p.* 902

Salisbury.—*Fisherton House Asylum.* Med. Supt., Dr. R. T. Finch. Access—Salisbury station, 5 minutes.

Laverstock House, Salisbury. Res. Med. Supt., E. C. Plummer, M.R.C.S. Access—Salisbury, 1½ miles.

Sevenoaks (Kent).—*Riverhead House* (for ladies). Res. Med. Supt., Dr. Wm. H. C. Macartney. Access—Sevenoaks station, S.E.R., ¾ mile.

Shrewsbury. — *Shropshire County Asylum.* Res. Med. Supt., W. S. Hughes, M.B., B.S. Access—Shrewsbury station, 2½ miles.

Sleaford.—*Kesteven County Asylum.* Med. Supt., J. A. Ewan, M.A., M.D. Access—Rauceby, G.N.R., ¼ mile.

Sligo.—*District Asylum.* Res. Med. Supt., Dr. Joseph Petit. Access—Sligo station, 1½ miles.

Stafford.—*County Mental Hospital.* Res. Med. Supt., Dr. J. W. S. Christie. Access—Stafford, 1 mile.

Coton Hill Mental Hospital, Stafford. Res. Med. Supt., Dr. R. W. Hewson. Access—Stafford, 1 mile. *See also p.* 902

Starcross (near Exeter).—*Western Counties Training Institution for the Feeble-minded.* Res. Supt., E. W. Locke. Access—Starcross.

Stirling.—*District Asylum*, Larbert. Med. Supt., Dr. R. B. Campbell. Access—Larbert, 1½ miles.

Stone (near Aylesbury). — *Bucks County Asylum.* Res. Med. Supt., H. Kerr, M.D. Access—Aylesbury station, 3½ miles.

Tamworth (Staffs.).—*The Moat House* (for ladies). Res. Licensees, Edward Hollins, M.A., J.P., and Mrs. S. A. Michaux. Access—Tamworth stat., ¾ mile. *See also p.* 896

Taunton.—*Somerset & Bath Asylum*, Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Access—Norton Fitzwarren stat., 2 miles.

Ticehurst (Sussex).—*Asylum.* Prop., Dr. H. Newington. Access—Ticehurst Road, 3 miles.

Tonbridge. — *Redlands.* Res. Med. Supt., W. A. Harmer, L.S.A. Access—Tonbridge junc., 1½ miles.

Virginia Water. — *Holloway Sanatorium*, Hospital for the Insane. St. Ann's Heath. Res. Med. Supt., W. D. Moore, M.D. Asst. Med. Offs., T. E. Harper, L.R.C.P., G. W. Smith, M.B., C. E. C. Williams, M.D., and Emma M. Johnstone, L.R.C.P. & S. Access — Virginia Water station, 5 minutes. Seaside Branch, *St. Ann's*, Canford Cliffs, Bournemouth. Med. Off., Alexr. M. Stafford, M.B. *See also p.* 898

Wadsley (near Sheffield). — *South Yorkshire Asylum.* Res. Med. Supt., W. J. N. Vincent, M.B. Access—Wadsley Bridge, 1 mile.

Wakefield. — *West Riding Asylum.* Res. Med. Supt., J. Shaw Bolton, M.D. Access—Kirkgate and Westgate station, 1 mile.

Wallingford (Berks).—*Berkshire Asylum.*—Res. Med. Supt., J. W. A. Murdoch, M.B. Access—Cholsey 1 mile.

Warlingham (Surrey). — *Croydon Mental Hospital.* Res. Med. Supt., E. S. Pasmore, M.D. Access—Upper Warlingham, 3½ miles.

Warwick.—*Midland Counties Institution*, Knowle (for feeble-minded children). Sec., A. H. Williams. Med. Off., J. [illegible], M.B.

Waterford.—*District Asylum.* Res. Med. Supt., J. A. Oakshott, M.D. Access—G. S. & W. R., North station, 2 miles.

St. Patrick's Private Asylum, Belmont Park. Conducted by the Brothers of Charity. Med. Supt., W. R. Morris, M.B. Access—Waterford station, 1 mile.

Wells.—*Somerset and Bath Asylum*, Wells, Som. Res. Med. Supt., Dr. G. Stevens Pope. Access—Wells station, 1½ miles.

Whitchurch (Salop). — *St. Mary's House* (ladies only). Res. Med. Supt., C. H. Gwynn, M.D. Access—Whitchurch, 1 mile. *See also p.* 905

Whitefield (near Manchester).—*Overdale.* Res. Phys., P. G. Mould, M.R.C.S. Access—Prestwich and Whitefield station, 1½ miles.

Whittingham (nr. Preston).—*County Asylum.* Res. Med. Supt., Dr. J. F. Gemmel. Access—Whittingham station, 3 minutes.

Winchelsea (Sussex).—*Periteau*, near Hastings (for ladies). Res. Phys., Harvey Baird, M.D. Access—Winchelsea station, 1 mile.

Witham (Essex).—*The Retreat.* Licensees, Drs. Haynes & Greenwood Penny. Res. Med. Supt., Dr. R. A. Greenwood Penny. Access—Witham station, ½ mile.

Woking. — *Surrey County Asylum*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Access—Brookwood station, 1½ miles.

Worcester.—*County & City Lunatic Asylum*, Powick. Res. Med. Supt., Dr. G. M. P. Braine-Hartnell. Access—Worcester station, 4 miles.

York.—*The Pleasaunce* (ladies only). Res. Med. Prop., Dr. A. W. Llewelyn Jones. Access—York, 1½ miles.

The Retreat, York. Res. Med. Supt., Bedford Pierce, M.D., F.R.C.P. (Lond.). Access—York station, 1½ mile. Also [illegible] *Hall*, a branch house, near Scarborough. *See also p.* [illegible]

Bootham Park Registered Hospital, York. Res. Med. Supt., G. R. Jeffrey, M.D. Access—York stat., 1 mile. *See also p.* [illegible]

North Riding of Yorkshire Asylum, Clifton. Res. Med. Supt., [illegible]. Access—York, 2 miles.

SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

Aberchalder (N.B.).—*Inverness-shire Sanatorium.* Med. Supt., D. S Johnston, M.D. Access—Aberchalder, 2 miles.

Aysgarth, S.O. (Yorks). — *Wensleydale Sanatorium.* Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.B., B.S. Access—Aysgarth, ½ mile, via Northallerton, N.E.R., and Hawes Junction, M.R

See also p. 88]

Banchory (Scotland).—*Nordrach-on-Dee.* Res. Phys., D. Lawson, M.A., M.D. Access—Banchory station, 1½ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne and Northumberland Sanatorium.* Res. Med. Off., Dr. W. C. Rivers. Access—Barrasford, N.B.R., 4 miles.

Belbroughton (Worcs.). — *Bourne Castle Sanatorium.* Res. Phys., W. Bernard Knobel, M.D. Access—Hagley, G.W.R.; Bromsgrove, M.R.

Benenden (Kent). — *Sanatorium* of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis." Two Res. Med. Officers. Apply, Secretary. Access—Biddenden station, 3 miles.

Bingley (Yorks.). — *Eldwick Sanatorium* (for women and children) Res. Med. Off., Dr. Marjorie Chapman. Access—Bingley stat., 2 mls.

Bolton (Lancs).—*Wilkinson Sanatorium for Consumptives.* Med. Off., Dr. J. D. Marshall. Sec., F. Nightingale, 12, Acresfield. Bolton.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest.* Sec., A. G. A. Major. Res. Phys., Dr. Stephen Green. Access — Bournemouth station, 1 mile.

The Firs Home (for advanced cases). Hon. Sec., Colonel R. F. Anderson, Bournemouth. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss Ingram. Access—Bournemouth Central. ½ mile.

The Home Sanatorium, West Southbourne, near Bournemouth. Res. Med. Supt., J. E. Esslemont, M.B., Ch.B. Access—Bournemouth Central, 2½ miles; Boscombe, 1½ miles; Christchurch, 2½ miles.

See also p. 88]

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland.* Hon. Treas., J. P. Maclay, Esq., 21, Bothwell Street, Glasgow. Med. Supt., James Crocket, M.D. Access—Bridge of Weir, 2 miles.

Brighton. — *Municipal Sanatorium,* for Brighton townsfolk (early and advanced cases). Med. Supt., Dr. Duncan Forbes, M.O.H. for Brighton. Particulars, Town Hall, Brighton.

Chagford (Devon).—*Dartmoor Sanatorium.* Res. Med. Supt., Dr. C. H. Berry. Access — Moretonhampstead, G.W.R., 6 miles; Okehampton station, L. & S.W.R., 11 miles.

Cheddar (Somerset).—*Engel Home,* (for females). Med. Supt., R. W. Statham, M.R.C.S. Apply to Lady Supt. Access — Cheddar station, 15 minutes.

Chelmsford (Essex).—*Great Baddow Sanatorium* (for males). Med. Supt., A. Lyster, M.D. Access—Chelmsford station, G.E.R.

Cheltenham.—*Cranham Lodge Sanatorium,* near Stroud. Res. Med. Supt., A. H. Hoffman, M.D.

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. A. K. Traill. Access—Leckhampton, 2½ miles.

Chesterfield (Derbyshire).—*Ashover Sanatorium.* Med. Supt., Dr. Ida E. Fox. Access—Stretton, M.R., 3½ miles.

Danbury (Essex).—*Alfred Boyd Memorial Sanatorium* (for ladies), Little Gibcracks, Essex. Med. Supt., A. Lyster, M.D.

Darlington.—*Felix House,* Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Access — Dinsdale, N.E.R., 5 minutes.

Devon and Cornwall *Sanatorium*, Didworthy, South Brent. For consumptive poor of the two counties. Hon. Sec., S. Carlile Davis, Esq., Princess Chambers, Princess Sq., Plymouth. Res. Med. Supt., Dr. W. D. [illegible]. Access—[illegible] Brent, G.W.R., 2 miles.

Doneraile (Co. Cork).—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Access—Buttevant, G.S. & W.R., 5 miles.

Dorking (Surrey). — *Woodhurst Sanatorium* (for women and children), Tower Hill. Sec., Mrs. G. Wright. Visiting Phys., Miss Mary R. McDougall, M.B., C.M.Ed. Access—L.B. & S.C.R. and the S.E. stations, both about 1½ miles.

Dundee (near). *Sidlaw Sanatorium*. Res. Med. Off., [illegible], M.D. Access—Auchterhouse stat., 1½ miles.

Durham.—*Durham County Consumption Sanatoria*. Sec., Mr. F. Forrest, 54, John Street, Sunderland. For men: Stanhope, Med. Supt., Dr. John Gray. Access—Stanhope station, 1 mile. For women and children: Wolsingham, Med. Supt., Dr. Menzies. Access—Wolsingham station, ¾ mile.

Edinburgh.—*Royal Victoria Hospital for Consumption* (for poor patients). Visiting Physicians, Sir Robert Philip and Dr. G. L. Gulland. Clerk and Treasurer, L. B. Bell, C.A., 42, Castle Street, Edinburgh.

Woodburn Sanatorium, Canaan Lane, Edinburgh. Res. Med. Prop., Mrs. I. Mears, L.R.C.P.I.

Eversley (Hants).—*Moorcote Sanatorium*. Res. Med. Supt., J. G. Garson, M.D. Access—Wellington College station, 4½ miles; Wokingham station, 6 miles; Fleet, 6 miles. [illegible]

Farnham (Surrey).—*Crooksbury Sanatorium*. Res Phys., Dr. George Fleming. Access—Farnham station, [illegible] miles; Tongham, [illegible] miles; [illegible], 4 miles.

Whitmead Sanatorium, Tilford, near Farnham. Res. Phys., J. [illegible], M.D. Access—Farnham station, 3½ miles.

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases*. Res. Phys. Dr. J. McG. Williams. Sec., J. Osborne, Scottish Provident Building, Belfast. Access—Belfast, 2 miles.

Frimley (Surrey).—*Brompton Hospital Sanatorium*. Res. Med. Supt., Dr. W. O. Meek. Access—Frimley station, 2 miles.

Grange-over-Sands.—*Westmorland Sanatorium*. Res. Med. Supt., C. F. Walker, M.D. Access—Grange-over-Sands station, 2¾ miles.

Hastings.—*Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption and Diseases of the Chest (for Out-Patients), 26, Margaret St., W. Sec., Mabel C. Hawthorne. Med. Off., Dr. N. F. Stallard. Access—Hastings, Tram, about 15 minutes.

Heswall (Cheshire). — *West Derby, Liverpool, and Toxteth Park Joint Sanatorium*. Med. Supt., J. B. Yeoman, M.D. Matron, Miss Bateson.

Hull.—*Hull and East Riding Convalescent Home*, Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull. Med. Off., A. E. Sproulle, L.R.C.P. Access—Withernsea stat.

Isle of Wight. — *Royal National Hospital for Consumption*, Ventnor. Senr. Res. Med. Off., Dr. Edgar Taunton. Sec., Charles W. Cox, 18, Buckingham Street, Strand, W.C. Access—Ventnor, 1 mile.

St. Catherine's Home, Ventnor (for advanced cases). Apply to the Sister-in-Charge. Med. Off., H. F. Bassano, M.A., M.B. Access—Ventnor, [illegible]

Kinross-shire (Scotland).—*Ochil Hills Sanatorium*, Milnathort. Med. Supt., Dr. W. [illegible]. Access—Kinross junction, 4 miles.

Kirkcaldy. — *Sanatorium for Consumption*. Med. Supt., Dr. G. W. [illegible]. Sec., The Town Clerk.

Lanark.—*Bellefield Sanatorium*. Res. Med. Supt., Dr. J. W. Allan. Access—Lanark, 10 minutes.

Lanchester (Durham).—*Maiden Law Sanatorium*. Med. Off., Dr. W. M. [illegible]. Sec., W. H. [illegible]. Access—Annfield Plain sta., 1 mile.

Leeds.—*Leeds Sanatorium for Consumptives*, Gateforth, near Selby, and *Leeds Hospital for Consumptives*, Armley. For poor of Leeds. Sec., C. H. Sedgwick, 37, Great George St., Leeds

Liverpool.—*Liverpool Sanatorium for Consumptives*, Kingswood, Frodsham. Sec., Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., A. Adams, M.D. Access—Frodsham station, L. & N.W.R., 3½ miles.

Llanybyther (Carmarthenshire). — *West Wales Sanatorium.* The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. H. O. Blanford. Access—Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of Chest*, Victoria Park, E. Res. Med. Off., Dr. J. Inkster. Sec., Geo. Watts. Access—Cambridge Heath, G.E.R., 5 minutes.

Mount Vernon Hospital for Consumption and Diseases of the Chest, Hampstead. Access—Finchley Road (Met.) station, 1 mile. *Sanatorium* at Northwood. Access—Northwood (Met. & G.C. Rly.) Hon. Vis. and Res. Staff. Secretary, W. J. Morton.

Royal Hospital for Diseases of the Chest, 231, City Road, E.C. Med. Off., Dr. D. B. Evans. Apply to the Secretary.

Long Stratton (Norfolk).—*Fritton Open-Air, Colony*, "The Beeches." Med. Director, Dr. Annie McCall, 165, Clapham Road, S.W. Access—Forncett station, G.E.R., 4 miles. *See also p.* 884

Manchester.—*Hospital for Consumption and Diseases of Throat and Chest*, Bowdon; *Crossley Sanatorium*, Delamere, Cheshire. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Manchester. Res. Phys. (Bowdon), Dr. G. K. Thompson; (Delamere), G. Heathcote, L.R.C.P., & S.

Margate (Kent).—*Royal Sea-bathing Hospital* (for Surgical Tuberculosis). Sec., A. Nash, 13, Charing Cross, S.W. Access — Margate West ¼ mile.

Mendip Hills.—*Mendip Hills Sanatorium*, Wells, Somerset. Res. Phys., D. J. Chowry Muthu, M.D. Access—Wells station, 2¾ miles. *See also p.* 883

Nordrach-upon-Mendip, Blagdon, near Bristol. Res. Phys., R. Thurnam, M.D. Access—Burrington station, 5 miles.

Midhurst (Sussex).—*King Edward VII Sanatorium.* Res. Med. Supt., N. D. Bardswell, M.D. Access—Midhurst, 4 miles.

Nayland (Suffolk). — *East Anglian Sanatorium*, and *Maltings Farm Sanatorium* for poor men and women patients. Med. Supt., Dr. Jane Walker, 122, Harley Street, W. Access—Bures station, G.E.R., 3½ miles.

New Cumnock (Ayrshire).—*Ayrshire Sanatorium*, Glenaften. Res. Med. Supt., E. E. Prest, M.D. Access—New Cumnock, 3 miles.

Norfolk.—*Kelling Sanatorium*, Holt. Res. Med. Supt., Mr. J. I. W. Morris. Access—Holt station, 1½ miles.

Mundesley Sanatorium, Mundesley. Res. Phys., S. Vere Pearson, M.D. Access—Mundesley, 1 mile.

Northallerton (Yorks). — *Ruebury Sanatorium*, Osmotherley. Res. Med. Prop., H. B. Luard, F.R.C.S. Access—Northallerton, N.E.R., 8 miles, Trenholme Bar, 4 miles. *See also p.* 883

Northampton.—*Northamptonshire Sanatorium*, Creaton. Res. Med. Supt., Dr. J. A. Kilpatrick. Access—Brixworth, L. & N.W.R., 3 miles.

Nottingham.—*Ransom Sanatorium*, Sherwood Forest, Mansfield. Res. Med. Off., Dr. G. M. Dobrashian. Access—Mansfield, 3 miles.

Oban, Scotland. — *Argyll County Sanatorium.* Vis. Med. Off., Duncan MacDonald, M.D. Hon. Sec., Roger McNeill, M.D. Access—Oban, 1 mile.

Ockley *Sanatorium* (Surrey). Res. Phys., Dr. Clara Hind. Access—Ockley, L.B. & S.C.R., 1 mile.

Painswick (Glouc'stershire).—*Painswick Sanatorium*, Cotswold Hills. Res. Phys. and Prop., W. McCall, M.D. Access—Stroud, 4 miles; Gloucester, 6 miles.

Peebles.—*Manor Valley Sanatorium.* Med. Off., C. B. Gunn, M.D.

Penmaenmawr (N. Wales).—*Nordrach in Wales, Pendyffryn Hall.* Res. Phys., Dr. G. Magill Dobson.

Peppard Common (Oxon).—*Kingwood Sanatorium*, for ladies; *Maitland Sanatorium*, for working classes. Med. Supt., Dr. Esther Carling. Access—Reading, 6½ mls.

Ringwood (Hants).—*Linford Sanatorium.* Res. Phys., H. G. Felkin, M.D., A. de W. Snowden, M.D., and H. A. F. Wilson, M.R.C.S. Access—Ringwood station, 2½ miles.

Rudgwick (Sussex). — *Rudgwick Sanatorium.* Vis. London Phys., Dr. Annie McCall, 165, Clapham Road, S.W. Access — Rudgwick stat., 5 minutes; Horsham stat., 7 miles. *See also p.* 884

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium, Llanbedr Hall.* Res. Prop., Dr. G. A. Crace-Calvert. Access—Ruthin station, 2 miles. *See also p.* 883

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Res. Phys., T. Gambier, M.D. Access — West St. Leonards, S.E.R., West Marina L.B. and S.C.R., within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Merivale Sanatorium.* Res. Phys., H. N. Marrett, M.R.C.S. Access—Chelmsford station, G.E.R., 3½ miles.

Sheffield. — *City Hospitals for Consumptives*: Winter Street (for advanced male cases); Crimicar Lane (for males); Commonside (for females). Med. Supt., H. J. E. H. Williams, M.D.

Shirlett, near Broseley (Shropshire). —*King Edward VII Memorial Sanatorium.* Res. Med. Supt., Dr. F. H. Pearce. Access—Much Wenlock station, 4 miles.

Skipton (Yorks).—*Eastby Sanatorium*, for males. Conducted by Bradford Board of Guardians. Med. Supt., B. H. Slater, F.R.C.S. Access—Embsay station, 2 miles.

Stannington (Northumberland). —"*Philipson*" *Children's Sanatorium.* Matron, Miss S. M. Robson. Vis. Phys., T. M. Allison, M.D. Access—Stannington station, 3 mls.

Threlkeld (Cumberland). — *Blencathra Sanatorium.* Res. Med. Supt., Dr. W. Goodchild. Access—Threlkeld, C. K. & P. R., 2 miles.

Torquay.—*Mildmay Consumption Home* for advanced cases (women) only. Hon. Med. Offs., F. D. Crowdy, M.D., and H. P. Wiggin, M.R.C.S. Hon. Sec., Miss F. Gumbleton, Connemara, Torquay. Access—Torquay, 1 mile.

Western Hospital, Torquay. Open Oct. to May. Sec., F. Manley.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium.* Res. Phys., B. H. Steede, M.D. Access—Warrenpoint. *See also p.* 884

Wicklow.—*The Royal National Hospital for Consumption for Ireland.* Newcastle, Wicklow. Res. Med. Off., Dr. Chas. D. Hanan. Access—D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles.

Winsley, near Bath.—*Winsley Sanatorium.* For residents in the Counties of Bristol, Gloucester, Somerset and Wilts. Sec., Frederic Jones. Access — Limpley Stoke station, 1 mile.

Wokingham.—*Pinewood Sanatorium.* Res. Med. Supt., F. K. Etlinger, M.R.C.S. Access — Wellington College, S.E.R., 2 miles; or Wokingham, S.W.R., 3½ miles.

Worcester (near).—*Knightwick Sanatorium.* Res. Med. Supt., Dr. H Gordon-Smith.

Yelverton (South Devon). *Udal Torre Sanatorium.* Res. Med. Supt. and Prop., J. Penn Milton, M.R.C.S.

INSTITUTIONS FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879–1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they **consider the patient an "Inebriate" within the meaning of the Acts.**

* **NOTE:– Ashford is a Roman Catholic Religious Institution.**

† Cinderford, Herne Hill, Terrington St. Clement, and Torquay, are C.E.T.S. Institutions.

MALES ONLY.

Buntingford (Herts). — *Buntingford House Retreat.* Two Res. Physicians. Access — Buntingford, G.E.R., 8 minutes. *See also p.* 887

Cinderford† (Glos.).—*Abbotswood House Inebriate Retreat.* Chaplain Supt., Rev. S. Scobell-Lessey, M.D. Access—Ruspidge or Cinderford. *See also p.* 888

Cockermouth (Cumberland).—*Ghyllwoods.* Res. Med. Prop., Dr. J. W. Astley Cooper. Access—Cockermouth, 11 miles. *See also p.* 886

Colinsburgh (Fife).—*Invernith Lodge.* Res. Med. Supt. and Licensee, Dr. W.H.Bryce. Access—Kilconquhar station, 4½ miles. *See also p.* 885

Folkestone.—*Capel Lodge,* near Folkstone. Res. Prop., E. Norton, M.D. Access—Folkestone Junc., 2 miles. *See also p.* 889

Rickmansworth (Herts).—*Dalrymple House.* Apply to Res. Med. Supt. Access — Rickmansworth station, Great Central & Metropolitan Railway, ½ mile; L. & N.W.R., 1 mile. *See also p.* 887

FEMALES ONLY.

Ashford, near Staines.*—*Ecclesfield.* Med. Supt., Dr. M. F. Cock. Apply, Mother Superior. Access—Ashford station, 1 mile. *See also p.* 886

Belfast. — *The Lodge Retreat,* Irwin Avenue, Strandtown. Med. Attendant, R. W. Leslie, M.D. Access —Bloomfield station, 5 minutes.

Beverley (E. Yorks).—*Albion House.* Res. Supt., the Matron. Hon. Sec., Mrs. T. R. Pentith, The Limes, Sutton-on-Hull. Vis. Phys., Geo. Savege, M.D.

Brighton.—*Park Gate,* Preston Road. Lady Supt., Sister Mary. Med. Off., R. J. Ryle, M.D., J.P. Access —Central station, ½ mile.

Erdington, nr. Birmingham.†—*Corngreaves Lodge.* Lady Supt., Miss Knapman. Med. Off., Dr. Featherstone. Access—Gravelly Hill station, ¼ mile. *See also p.* 888

Fallowfield. — *The Grove Retreat,* near Manchester. Licensee, Mrs. M. Hughes. Med. Offs., A. T. Wilkinson, M.D., J. W. Hamill, M.D., and Dr. Florence Robinson. Hon. Treas., S. Gamble. Access—Fallowfield station, 10 minutes. *See also p.* 888

Herne Hill.†—*Ellison Lodge,* Half Moon Lane. Res. Supt., Miss Corner. Med. Supt., Dr. T. H. Underhill. Access—Herne Hill, 10 minutes; North Dulwich, 3 minutes. Telephone: 1162 Brixton. *See also p.* 888

Leicester.—*Melbourne House,* Prop., Mr. H. M. Riley. Med. Attendant, R. Sevestre, M.A., M.D., Camb. London Consultant, W. Wynn Westcott, M.B. (Coroner N.E. London), 396, Camden Road, Holloway. Dublin Consultant, Sir Wm. J. Smyly, M.D., F.R.C.P.I., 58, Merrion Square, Dublin. Nat. Tel., 769 Leicester. Station, 2 miles. *See also p.* 889

Newmains (N.B.).–*Newmains Retreat* for ladies. Access — Hartwood station, Cal. Railway.

Reigate (Surrey). — *Duxhurst,* for women of all classes. Under the Superintendence of Lady Henry Somerset. Med. Supt., A. Walters, M.R.C.S. Access—Reigate, 4 mls. *See also p.* 888

Spelthorne St. Mary (Bedfont, Middlesex).—Apply to the Sister Superior, C.S.M.V. Access—Feltham, S.W.R., 1 mile.

Licensed under Inebriates Acts. Females—Primarily Gentlewomen and Middle Class (24). Treatment—Physical, Moral, and Spiritual. *See also p.* 888

Terrington St. Clement† (Norfolk).—[illegible] Lodge. Res. Supt., Miss Yolland. Med. Supt., S. R. Lister, M.R.C.S. Access—Terrington station, 1½ miles. *See also p.* 888

Torquay.† — *Temple Lodge.* Res. Supt., Sister in Charge. Med. Off., W. Odell, F.R.C.S. Hon. Sec., Mrs. H. Erskine. *See also p.* 888

Wandsworth. — *Northlands Retreat,* 20, Bolingbroke Grove, Wandsworth Common, S.W. Apply, the Misses Round, and Sister Reeve. Med. Attendant, Dr. J. Round. Access — Wandsworth Common station, L.B. & S.C.R. *See also p.* 888

REFORMATORIES CERTIFIED UNDER THE INEBRIATES ACT, 1898.

MALE AND FEMALE.

Bristol.—*Brentry certified Inebriate Reformatory,* Westbury-on-Trym. Res. Supt., Capt. Lay ; Med. Officer, Dr. Ormerod. Hon. Sec., Rev. H. N. Burden Access—Clifton Down, Redland, or Patchway stat., 3½ mls.

Cattal (Yorkshire).—*Yorkshire Inebriate Reformatory,* Cattal, near York. For Yorkshire cases. Res. Supt. and Med. Off., Dr. F. P. Hearder. Access—Cattal, 1 mile.

FEMALES ONLY.

Ackworth (Yorkshire).—*North Midland Inebriate Reformatory.* Res. Supt., the Officer in Charge. Med Off., Dr. Oyston. Access—Ackworth station, 1½ miles.

Bristol.—*Royal Victoria Home,* Horfield. Med. Off., Dr. C. Bernard. Hon. Sec., Rev. H. N. Burden. Access—Montpelier & Bristol stats.

Chesterfield (Derbyshire).—*Midland Counties Inebriate Reformatory,* Whittington. Med. Off., Dr. A. M. Palmer. Access — Whittington station, ½ mile ; Chesterfield, 5 miles.

East Harling (Norfolk). — *Eastern Counties Inebriate Reformatory,* East Harling, near Thetford. Res. Med. Supt., Dr. E. J. Manning. Access—Harling Road station, 3½ miles.

Horley (Surrey).—*Farmfield.* For London cases, under Sec. II of the Act. Res. Supt., Miss Forsyth Med. Off., Dr. C. F. Williamson. Access—Horley station, 2½ miles.

Langho (Lancashire). — *Lancashire Inebriate Reformatory,* Langho, near Blackburn. For Lancashire cases. Res. Supt. and Med. Off., Dr. F. A. Gill. Access—Langho station, 1½ miles.

UNLICENSED HOMES.

Beckenham (Kent).—*Norwood Sanatorium,* The Mansion, Beckenham Park. Med. Supt., F. Hare, M.D. Access—Beckenham Junc. station, 10 minutes. *See also p.* 886

Dublin.—*Farnham House,* Finglas. Res. Med. Supt., H. P. D'Arcy [illegible], M.D. Access—Dublin, 2 miles. *See also p.* [illegible]

Durham. — 24, Allergate, for friendless and inebriate women. 4s. per week. Hon. Sec., Miss King. Med. Supt., Dr. Smith. Access—Durham, ½ mile.

Harrogate (Near).—*Hill House,* Starbeck, Yorks., for women. Apply, Matron. Med. Off., Dr. Petch. Access—Starbeck station, ½ mile.

Heybridge, (Essex). — *Osea Island,* (for ladies and gentlemen). Vis. Phys., H. I. Price, F.R.C.S. Prop., F. N. Charrington, Esq.

Hounslow (Middlesex).—*West Holme,* for middle class and working women. Med. Supt., Dr. G. A. S. Gordon. Access—S.W. & Dist. Rly., ¼ mile.

Liverpool.—*Temperance Home,* 518 Upper Parliament Street, for women. Supt., Miss A. J. Wilson. Med Officer, C. E. Solomon, M.D. Access—Edge Hill station.

Port Stewart (Co. Derry).—*[illegible]aughrin Sanatorium.* Med. Supt., Dr. J. Quin Donald.

HYDROPATHIC ESTABLISHMENTS.

Ben Rhydding.—*Ben Rhydding Hydro.* Phys., Dr. F. J. Stansfield and Dr. W. R. Bates. Access—Station, a few hundred yards.

Bournemouth (Hampshire).—*Bournemouth Hydropathic.* Res. Phys., W. J. Smyth, M.D. Access—East station, 1½ mile; West station, ¼ mile.

Bridge of Allan.—*Bridge of Allan Hydropathic Co.* Manageress, Mrs. Gregory. Access—Station, ¾ mile.

Bristol.—*The Bristol Hydropathic* (formerly Bartholomew's Turkish Baths), College Green. Res. Phys., W. J. Spoor, M.B., M.R.C.S. Access—Temple Meads stat., 1¼ mile. Tel. 1851. *See also p.* 877

Bute.—*Kyles of Bute Hydropathic,* Port Bannantyne, Rothesay. Man., A. Menzies. Med. Supt., Dr. A. J Hall. Access—Clyde steamers call daily.

Buxton.—*Buxton Hydro Hotel.* Manager G. W. Bosworth. Access—Station, 4 minutes.

Caterham (Surrey).—*Caterham Sanitarium and Surrey Hills Hydropathic.* Res. Med. Supt., A. B. Olsen, M.D. Access — Caterham station. *See also p.* 882

Clifton (near Bristol).—*Clifton Grand Spa and Hydropathic.* Access—Clifton Down station, 1 mile; Bristol station, 1½ miles.

Cork.—*St. Ann's Hill Hydropathic.* Res. Phys., M. Orb, M.D., Erlangen (Germany). Access—Blarney sta., 2½ miles; Muskerry Light Railway from Cork, station on grounds.

Crieff.—*Strathearn House* (17 miles from Perth). Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Access—Crieff station, 1 mile.

Eastbourne.—*Eastbourne Hydropathic.* Manager, W. J. Grimes. Access — Eastbourne station, 5 minutes' drive.

Edinburgh.—*Hydropathic,* Slateford. Man. Director, J. Bell. Access—Merchiston, 1 mile; Waverley, 3 miles.

Forres.—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John Adam.. Access—Forres station, 1 mile; Inverness, 24 miles.

Grange - over - Sands. — *Hazelwood Hydropathic.* Physicians, Richard Lowther, M.D., and Owen Gwatkin, M.R.C.S. Access—Carnforth, L. & N.W.R., then by Furness Railway; Grange-over-Sands, ¼ mile.

Harrogate (Yorkshire).—*The Cairn Hydropathic.* Man., Mrs. Baker. Access—Harrogate station, ½ mile.

The Harrogate Hydropathic. Phys., Dr. T. Johnstone. Access—Harrogate station, ½ mile.

Hexham (Northumberland).—*Tynedale Hydropathic.* Prop., F. G. Grant. Med. Supt., Dr. D. Stewart. Access—Hexham, 1 mile; Newcastle, 19 miles.

Ilfracombe.—*The Cliffe Hydro.* Med. Supt., Chas. W. E. Toller, M.D. Apply to the Secretary. Station, 1 mile. *See also p.* 878

Ilkley (Yorkshire).—*Craiglands Hydro., Lim.* Res. Physicians, Henry Dobson, M.D., C.M. (Edin.), and Maurice R. Dobson, M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.). *See also p.* 878

The Spa Hydro. Hotel, Ilkley. Manager, J. S. Brodie. Vis. Phys., Dr. T. B. Hearder. Access—Ilkley, 3 minutes.

Limpley Stoke (near Bath).—*West of England Hydropathic.* Access—Limpley Stoke station. Apply, the Secretary.

Malvern.—*The Malvern Hydropathic.* Res. Prop., J. C. Fergusson, M.D. Access—Great Malvern station, ¼ mile. *See also p.* 880

Wyche-side Hydropathic. Access—Malvern Wells station, G.W.R., ½ mile; Great Malvern station, 2 miles.

Matlock.—*Matlock House Hydropathic,* Matlock. Secretary, Jno. McLaren, C.A., 65, New Broad Street, E.C. Access — Matlock, M.R., ¼ mile.

Rockside Hydropathic, Matlock. Med. Supts., Drs. Marie Goodwin (Resident) and Dr. Morton. Access —Matlock, [illegible] mile. *See also p.* [illegible]

Royal Hotel and Baths, Matlock Bath. Phys., W. C. Sharpe, M.D. Access—Matlock Bath station.

Smedley's Hydropathic, Matlock. [illegible] Access—Matlock station, ½ mile; omnibus. *See also p.* [illegible]

Moffat.—*The Moffat Hydropathic.* Man., Miss Gardner. Med. Supt., Dr. D. [illegible]. Access—Moffat station, 1 mile.

Peebles.—*Peebles Hotel Hydropathic.* Complete modern equipment of baths and electrical treatment. Plombières treatment for mucous colitis. Fango di Battaglia (Mud packs for sciatica, etc.). Res. Phys., Thomas D. Luke, M.D., F.R.C.S.Edin. Access—N.B. and Cal. stations about 10 to 15 mins. walk. *See also p.* [illegible]

Shandon.—*Shandon Hydropathic.* Consulting Phys., Dr. Wm. R. Sewill. Access—[illegible]

Skelmorlie.—*Wemyss Bay Hydro.* Med. Supt., Dr. W. C. Philp. Access—Wemyss Bay station, [illegible] mile.

Southport (Birkdale Park).—*Smedley Hydropathic.* Phys., J. G. G. Corkhill, M.D. Southport or Birkdale stations. *See also p.* 862

Kenworthy's Hydropathic, Southport. Res. Phys., Dr. Kenworthy. Access—Chapel Street (L. & Y.), Lord St. station (Cheshire Lines), ¼ mile. Tel. 80; Telegrams: Kenworthy, Southport. *See also p.* 882

Tunbridge Wells.—*The Spa Hotel.* Access—Station, about 1 mile; London, 34 miles. Apply, Manager. *See also p.* 877

Ulverston.—*Conishead Priory Hydropathic.* Visiting Physician, Dr. R. Ashburner. Access—Ulverston station, 1¾ miles.

NURSING INSTITUTIONS AND PRIVATE HOMES FOR INVALIDS.

NURSING INSTITUTIONS.

Bournemouth.—*Victoria Nurses' Institute*, Cambridge Road. Apply, the Matron. *See also p.* 865

Exeter.—*Royal Devon and Exeter Hospital*, Private Nursing Staff. Apply, the Matron. *See also p.* 860

London.—*Co-operation of Temperance Male and Female Nurses*, 48, Weymouth Street, W. Secretary, M. Sullivan. *See also p.* [illegible]

London Temperance Male and Female Nurses' Co-operation, 18, Adam Street, Portman Square, W. Sec., C. Webb. *See also p.* 859

Male Nurses Association, 29, York Street, Baker Street, W. Sec., W. J. [illegible]. *See also p.* [illegible]

Mental Nurses' Co-operation, 49 Norfolk Square, W. Lady Supt. Miss Jean Hastie. *See also p.* 850

St. Luke's Hospital, Old Street, E.C. Trained Nurses for Mental, and Nervous Cases. Apply Matron. *See also p.* [illegible]

Temperance Male Nurses' Co-operation, Ltd., 43, New Cavendish Street, W., also at [illegible], Glasgow, and Dublin. Secretary, M. D. Gold. *See also p.* liv.

York.—*The Retreat* (Trained Nurses Department, for mental and nervous cases only). *See also p.* 898

PRIVATE HOMES FOR INVALIDS.

Alderley Edge (Cheshire).—*The David Lewis Colony* (for Sane Epileptics), and *Colthurst House School* (for epileptic boys). Director, Alan McDougall, M.D. Access—Warford, near Alderley Edge, Cheshire. *See also p.* [illegible]

Bath.—*Lansdown Hospital and Nursing Home*, Bath (invalids only; special arrangements for patients suffering from gout, rheumatism, and physical infirmities). Med. Supts., Dr. Percy Wilde, and Dr Wells-Beville. Access—M. or G.W. stations, 1 mile. *See also p.* [illegible]

Billericay (Essex).—*New Lodge.* For epilepsy and mental deficiency. Med. Off. H. J. Price, F.R.C.S. *See also p.* 857

Bournemouth. — *Victoria Nursing Institute and Home,* Cambridge Road (for paying patients). Apply, the Matron. *See also p.* 865

Bristol. — *Private Nursing Home,* 595, Gloucester Road, Horfield. Apply, Mrs. Gotch. *See also p.* 861

Broadstairs. — *Bishopsbourne,* East Cliff. Invalid medical and surgical Home for children. Apply, Lady Superintendent. *See also p.* 865

Chorley Wood (Herts).—*The Laburnums,* Heronsgate. Private Home for epileptic, paralytic, and slight mental cases. Apply, Miss King. Access — Chorley Wood station, 1½ miles. *See also p.* 863

Church Stretton (Salop). — *Church Stretton Nursing Home,* "Ashford House." Apply, Misses Nicholls and Silverlock. *See also p.* 861

Edinburgh. — *Queensberry Lodge,* for ladies. Supt., A. Miller. Med. Supt., Dr. William Russell. Access —Waverley station, ½ mile. *See also p.* 860

Erdington.—*Rosevale Homes for Paying Patients,* Penns Lane. Rest cure, massage, etc. Apply, Miss C. L. Fallows. Access—Chester Road station, ¼ mile. *See also p.* 862

Hadlow Down, Buxted (Sussex).—*South Beacon* (for the care and treatment of gentlemen mentally affected, but not ill enough to be certified). Prop.,Philip H. Harmer. Access—Buxted, 3 miles; Mayfield, 4 miles; Heathfield, 4 miles. *See also p.* 862

Hampton Wick.—*Normansfield* (for the care and training of the mentally deficient). Apply, Dr. R. Langdon-Down. *See also p.* 861

Jedburgh.—*Abbey Green.* Res. Prop., Wm. Blair, M.D. Access—N.B.R., Jedburgh. Telephone No. 3. *See also p.* 866

Leamington Spa.—*Private Nursing Association Ltd.,* Warneford House. (Home for children and infants). Apply, Mrs. James Ward, M.I.H. *See also p.* 866

London.—*Manna Mead,* 17, The Grove, Blackheath, S.E. (for invalids and convalescents). Principals, Mrs. Knight and Miss Tapley Spurr. Access—Lewisham Junc., 15 minutes' walk. *See also p.* 863

St. Andrew's Hospital, Dollis Hill, N.W. Res. Med. Supt., D. D. Pinnock, F.R.C.S. *See also p.* 857

St. Thomas's Home, St. Thomas's Hospital, Westminster Bridge. Apply, Sydney Phillips, B.A., St. Thomas's Hospital, S.E. Access —Waterloo, 5 minutes. Tel.: Hop. 1637. *See also p.* 864

Mousehole (Cornwall). — *Lynwood.* Medical and rest cure Home Apply, Miss Enid Smith, M.B., B.S. (Lond.). Access—Penzance, 3 miles. *See also p.* 864

New Brighton.—*Convalescent Home for Women and Children.* Hon. Sec. and Treas., Frank Holt, Esq., 8, Cook Street, Liverpool. Lady Supt., Miss K. R. Bolton. *See also p.* 864

Reigate Hill (Surrey).—*The Beeches,* Wray Lane. Nerves, rest cure, massage, electricity, diet. Apply, Miss Goslett. Access — Reigate, or Redhill, 1 mile. *See also p.* 857

Southwell (Notts).—*Prebend House* (for Weir-Mitchell treatment, rest cure, massage, etc.). Apply, Dr. T. S. Elliott. *See also p.* 861

St. Leonards - on - Sea. — *Nursing Home,* 57, Marina. Apply, Miss South. *See also p.* 865

Swanmore, Ryde, I.W.—*St. Luke's Home* for epileptic churchwomen, Swanmore, Ryde, I.W. Med. Supts., A. Banks, F.R.C.S., and Dr. S. Churchill. *See also p.* 857

Teignmouth. — *Buckeridge Lodge.* Invalids, maternity cases, or children. Apply, Sister. *See also p.* 866

Tunbridge Wells.—*Mount Ephraim Nursing Home,* 8, Molyneux Park. Medical, surgical, Weir-Mitchell, and massage cases. Excellent facilities for open-air treatment. Apply, Miss Baxter. Access — S. E. & Chatham Station, 10 mins. *See also p.* 866

Westcliff-on-Sea.—*St. Ursula,* King's Road. Medical and rest Home. Apply, Miss Haslock. Access—Station, 15 mins. *See also p.* 866

PRINCIPAL BRITISH SPAS,

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

Revised by N. Hay Forbes, F.R.C.S. Edin., F.R.S. Edin.

Bath (Somerset).—Sheltered from the N. and N.E. winds by a range of hills from 600 to 800 feet high; 2 hours from London (Paddington), 12 miles from Bristol. Rainfall, 37·3 inches in 1912, and sunshine, 1362 hours. Climate mild and equable. (*See also p.* 877).

Waters.—The only *hot* springs in Great Britain. Three springs yield over half a million gallons of water daily, the temperature of the hottest is 120° F. The waters contain sulphates of calcium, strontium, sodium, and potassium, with calcium carbonate, the chlorides of magnesium, sodium, and lithium.

Therapeutic Indications.—Gout, chronic rheumatism, rheumatoid arthritis, sciatica, disorders of the digestive organs, anaemia, skin diseases, functional nervous disorders and debility.

Baths.—Modern baths of every description, including Aix douche massage, deep baths, electric, water and hot air, natural vapour, needle, intestinal douches for muco-membranous colitis and allied conditions, sulphur, Nauheim, and Zander medico-mechanical treatment.

Nursing and Baths.—Lansdown Grove House (*See p.* 862).

Bridge of Allan (Stirlingshire).—422 miles from London, 3 miles north of Stirling. Sheltered from the north and east winds by the Ochil Hills. On the direct route to London, and within an hour's rail journey of Edinburgh and Glasgow. Average rainfall 33·24 inches. Climate mild and equable all the year.

Waters.—Natural mineral waters from six springs (earthy), at a depth of about 110 feet, exceedingly rich in saline, the chief ingredients being various salts of calcium, sodium and magnesium. These waters are once more coming into great prominence.

Therapeutic Indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, and in rheumatism, gout, sciatica, and other nerve affections, also some diseases of the skin.

Baths.—Excellent suite of baths, with skilled attendants.

Buxton (Derbyshire).—1000 feet above sea level, 3½ hours from London (St. Pancras), 25 miles from Manchester, 30 from Sheffield, 53 from Liverpool. Bracing climate. Rainfall, 54·4 inches in 1912, and 1048 hours of sunshine. Lowest absolute humidity of any health resort in Great Britain.

Waters.—Thermal springs 82° F. Powerful radio-active properties. More highly charged with nitrogen gas than any other spring. Chalybeate spring.

Therapeutic Indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, nervous diseases, skin diseases, especially those of gouty origin, neuritis and other [illegible] diseases, colitis, anaemia, phlebitis, and diseases of women.

Baths.—Over 70 different treatments. Every proved treatment installed. Recent official report of Devonshire Hospital gives percentage of cures as [illegible] per cent extending over last five years. (*See also p.* [illegible]).

Cheltenham (Gloucestershire).—185 feet above sea level, 3 hours from London. Rainfall, 34·7 inches in 1912, and sunshine [illegible] hours. Town very free from fogs. Protected from N. and N.E. winds.

Waters.—The mineral waters are of two kinds. One is alkaline from contained sodium carbonate, the other is impregnated with the sulphates of soda and magnesia. They are now receiving considerable attention from the medical profession, and seem likely to successfully compete with Carlsbad and Vichy in attracting a portion of the patients formerly sent abroad.

Therapeutic Indications.—Gout, dyspepsia, metabolic disorders generally and neurasthenia.

Baths.—Good modern baths, with massage.

Church Stretton (Salop).—613 feet above sea level, in the "Highlands of England." 4¼ hours from Euston, 3¾ hours from Paddington, 1½ hours from Birmingham, 2½ hours from Liverpool and Manchester, and 2½ hours from Bristol. Air noted for its extreme purity, bracing, with a somewhat tranquillizing influence, and a generally invigorating climate. Hills 1250 to 1700 feet high. Prevailing wind, S.W. Rainfall, 40·68 inches in 1912. Modern drainage. Porous soil.

Waters.—Said to be the purest in England; useful in gout, rheumatism, chronic renal affections, and arteriosclerosis.

Therapeutic indications.—Specially the "open-air" cure of neurasthenia, for sequelæ of influenza, insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork, and convalescence after illness or operation. "Terrain cure," and special physical exercises for obesity, myocardial atony, early arteriosclerosis, hepatic inadequacy and constipation. A good "after-cure" resort from Bath, Buxton, Cheltenham, Droitwich, Leamington, and Llandrindod Wells.

Nursing.—Ashford House (Church Stretton Nursing Home) (*See p.* 861).

Droitwich (Worcestershire).—150 feet above sea level, 2½ hours from London (Paddington), 19 miles from Birmingham, 6 from Worcester. Rainfall 23 inches. Mean winter temperature 47° F., summer 69·9° F. Well protected from N. and N.E. winds (*See also p.* 876).

Waters.—The most powerful saline in the world. The brine is pumped from 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 to 12 times as strong as that of the ocean (Channel), containing in every gallon 20,000 grains of saline in excess of any known waters: the waters possess radio-active properties.

Therapeutic indications.—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, heart diseases, especially those of myocardium—effect similar to Nauheim treatment—neurasthenia, anæmia, chlorosis, some sclerotic diseases of spinal cord, dry, scaly skin diseases, e.g., chronic eczema and psoriasis.

Baths.—Immersion, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, etc.

Hotel.—Worcestershire Brine Baths Hotel, and Brine Baths (*See p.* 876).

Boarding Establishment.—Ayrshire House (*See p.* 882).

Harrogate (Yorkshire).—400 feet above sea level, 4 hours from London, 18 miles from Leeds. The climate is stimulating and fairly dry—bracing moorland air. Rainfall in 1912, 41·8 inches, and sunshine, 1079 hours.

Waters.—Celebrated for the medicinal properties of its 80 springs—sulphurous, chalybeate, alkaline, and saline.

Therapeutic indications.—Anæmia, chlorosis, gout, rheumatism, disorders of liver and stomach, muco-membranous colitis, chronic appendicitis, and skin diseases.

Baths.—There are four establishments, where numerous treatments are given, including sulphur baths, douche, Nauheim, vapour, Russian, Turkish, electric, mineral, electric light, ozone, throat and nasal.

Hotel.—The Prospect Hotel (*See p.* 879).

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe, rising rapidly from the bank of the river to a height of 1320 feet above sea level. Occupying a sheltered position. Annual rainfall, about 32 inches. Mean annual temperature 48° F. Death-rate 8 per 1000. Being in close proximity to extensive moors the air is bracing and exhilarating and at the same time dry and soft, having a wonderfully restorative effect upon invalids such as Anglo-Indians, delicate children, and convalescents.

Waters.—The water supply obtained from springs is remarkably pure, bright and sparkling. Chalybeate waters. Saline.

Therapeutic indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Hydropathic Establishment.—Craiglands Hydropathic (*See p.* 758).

Llandrindod Wells (Radnorshire).—Situated in Central Wales, at an altitude of 750 feet. About 5 hours from London. It lies in the centre of a plateau of hills rising in places to over 2000 feet. Sheltered from the east, and open to the south and west. The soil is porous, and dries up quickly after rain. The climate is extremely bracing. Rainfall 43·24 in 1912.

Waters.—There is a great variety of mineral waters—saline, sulphurous, iron, magnesium, chloride of calcium, and lithia springs similar in composition to those at Kissingen and Homburg. Slightly aperient and strongly diuretic.

Therapeutic indications.—The diseases most benefited are those in which any digestive derangements are present, the various forms of gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus, or any kidney or bladder condition requiring diuresis, neurasthenia, or debility from over-work or convalescence.

Llangammarch Wells (Breconshire).—In an open valley surrounded by moorland, 600 feet above sea level. 5¼ hours from London. Mean annual temperature 47·5° F., summer 55·4° F. Sunshine in 1912, 1085 hours, and rainfall 59·3 inches. Well protected from the east.

Water.—Saline, containing the chlorides of barium (6¼ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles. The barium salt has a physiological action on cardiac muscle similar to that of digitalis and strophanthus, and is also a good diuretic. Administered both internally and externally. Temperature 50° F.; is heated for bathing purposes. A modified Nauheim system of baths (immersion, douche, and needle), exercises, massage, and hill climbing is carried out.

Therapeutic indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Malvern (Worcestershire).—Situated at an altitude of 520 feet above sea level, on eastern slope of Malvern Hills (9 miles long and rising to 1400 ft.). 2¾ hours from London (Paddington), and about 1 hour from Birmingham. Original home of hydropathy. Soil gravelly (syenite detritus). Air dry and bracing, cool in summer and warm in winter. Rainfall, 43 inches in 1912. Mean annual temperature 49·58°, with low daily variation; daily mean of bright sunshine in 1912, 3·08 hours. Lowest death-rate of any inland watering place. Sanitation perfect. (*See also p.* 881).

Water.—Mainly springs, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon. W. & J. Burrow's Malvern Waters (*See p.* [illegible]).

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

Baths.—Natural pure brine (from Droitwich), Turkish and electric baths, Vichy massage and Aix douches, Fango-di-Battaglia.

Hotels.—British Camp Hotel, Wynd's Point (*See p.* 880), and Malvern House Hotel (*See p.* 883).

Hydropathic Establishment.—The Malvern Hydropathic (*See p.* 880).

Matlock Bath (Derbyshire).—300 to 800 ft. above sea level. 4½ hours from London (St. Pancras), 46 miles from Manchester, 18 from Derby. Rainfall in 1912, 41·4 inches, and sunshine, 1032 hours. Very sheltered.

Water.—Thermal Springs. Mild sulphated alkaline saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate. Owing to their peculiarly soft and unctuous character they are especially valuable in bathing and douche operations, particularly those associated with massage, such as the "Aix" and "Vichy" douches.

Therapeutic indications. Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, digestive and biliary disorders.

Baths.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Fango-di-Battaglia. The volcanic mineral deposit from the hot springs near Padua (N. Italy) is imported, and extensively used in the treatment of gout, rheumatoid arthritis, and neuritis.

Matlock Bank (*Matlock* station, one mile by rail from Matlock Bath).—500 to 800 feet above sea level, $3\frac{1}{2}$ hours from London (St. Pancras), 45 miles from Manchester, 17 from Derby. South-westerly aspect, and well sheltered from the north. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal Hydros are installed with latest electric baths and appliances, including high-frequency, Dowsing radiant light and heat, Schnee four-cell, X rays, etc. They also include Turkish, Russian, plunge, medicated and inhalation baths, Aix and Vichy douches.

A feature of the Matlock Hydros is that, as a rule, they are complete in their own grounds, and contain croquet and tennis lawns, and bowling and putting greens, which, as a means of recreation and exercise, form a valuable auxiliary to a course of hydropathic treatment.

Hydropathic Establishments.—Rockside Hydropathic (*See p.* 872) and Smedley's Hydropathic (*See p.* 873).

Peebles (**Peebleshire, N.B.**).—500 ft. above sea level. One hour from Edinburgh and 8 from London (viâ Galashiels). Rainfall, 27 inches. Bracing climate, but sheltered from the north winds. Mean annual mortality rate 11 per mil. Population 6000 in winter, and 10,000 in summer.

Waters.—The waters are of the halothermal type, similar to Kissingen and Kreuznach. The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well.

Therapeutic indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, and, in this respect, seem likely to compete with the above-mentioned continental resorts, patients being saved the long journey, and also, after the baths, are conveyed by lift immediately to their rooms for resting. The waters are also suited to dyspepsia, gout, rheumatism and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango-di-Battaglia).

Hydropathic Establishment.—Peebles Hotel Hydropathic (*See p.* 871).

Ripon (**Yorkshire**).—Situated on rising ground near the junction of the Rivers Ure and Skell. On the N.E. Railway, $4\frac{3}{4}$ hours from London. 120 feet above sea level. Climate mild but bracing. Soil, gravel and sand, and dries quickly after rain. Prevailing winds, W. and S.W. Surrounding country well wooded and very beautiful, Fountains Abbey and many other places of interest are within easy reach. The Yorkshire Moors are only a few miles from the City (*See also p.* 870).

Waters.—Saline Sulphur Water brought down from Aldfield Spa, 4 miles distant to the New Baths erected in 1904.

Therapeutic indications. Chronic and subacute gout and rheumatism, rheumatoid arthritis, skin diseases (eczema, psoriasis, acne), catarrhs, gastric and liver derangements.

The Baths have been lately equipped with up-to-date electric apparatus for electric treatments (*See also p.* 870).

Royal Leamington Spa (Warwickshire).—195 feet above sea level. 1 hour 50 minutes from London (Paddington or Euston). 24 miles from Birmingham. Equable and mild climate, with low rainfall. Westerly winds prevail.

Waters.—Saline, resembling those of Homburg, but more generally useful.

Therapeutic Indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a persistent condition of the chylopoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension and chronic interstitial nephritis.

Baths.—Turkish, medicated, swimming, and electric of all kinds.

Nursing.—Private Nursing Assoc. Ltd., Warneford House (*See p.* [illegible])

Strathpeffer Spa (Ross-shire, N.B.).—In the Highlands of Scotland. 150 to 300 feet above sea level. Through carriages twice a week during summer from London, 14 hours. Sheltered from N. and N.E. winds. Prevailing wind S.W. Sandy soil. Bracing air. Sunshine in 1912, 1002 hours and rainfall, 31·4 inches.

Waters.—Sulphurous and chalybeate. Former, very rich in sulphuretted hydrogen gas and sulphates. Four sulphur wells in use: (1) Old well; (2) Upper; (3) Strong; (4) Cromartie. No. 4 contains over 19 cubic inches H_2S to gallon. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic Indications.—Chronic and subacute gout and rheumatism (especially articular), rheumatoid arthritis, chronic skin diseases (eczema, acne, psoriasis), especially when gouty or rheumatic, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, neurasthenia, anaemia, obesity, chronic metallic poisoning, dilatation of heart, neuritis.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, plunge, Russian, Nauheim, radiant heat (electric), and high-frequency current.

Hotel.—The Ben Wyvis Hotel (*See p.* 8[illegible]4)

Trefriw Wells (Carnarvonshire).—A chalybeate spa in the Conway valley, one mile from Llanrwst station (L. & N.W.R.) between Conway and Bettws-y-Coed; 5 hours by rail from London, 4 from Leeds and 2½ from Liverpool. The season is from the latter half of April to the end of September, but the spa is "open all the year round." The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type; it is recommended for the convalescent and the neurasthenic.

Waters.—Two varieties: (1) The aluminous chalybeate, and (2) the sulpho-magnesian chalybeate; the former contains 4·36 grains per ounce of crystalline ferrous sulphate, and the latter 1·95 grains per ounce of the same salt. Used internally, and externally in the form of baths.

Therapeutic Indications.—Speaking broadly, these include all those morbid conditions in which iron is indicated; conditions which, as a rule, mainly depend on some degenerative or destructive changes in the blood, e.g., primary and secondary anaemias, chlorosis, and the post-febrile debility of enteric and scarlet fevers. Also for the so-called "metabolic" diseases, which chiefly consist in some digestive inefficiency, some incomplete elimination of food toxins and other various waste products, and some defective blood formation—factors found in such diseases as gout, chronic articular rheumatism, neuritis, sciatica, and in the tardy convalescence following exhausting diseases. These waters are also useful in certain chronic skin diseases, e.g., psoriasis, eczema, acne and impetigo. They are also suitable for the anaemia of "granular kidney," for some types of chronic catarrhal disease of mucous membranes, and for the usual forms of round-worm and tape-worm. The initial doses are small, usually from 2 or 3 teaspoonfuls to one or two tablespoonfuls gradually increased, being taken from first to last under medical supervision (*See also p.* 870).

Tunbridge Wells (Kent).—400 feet above sea level, 1 hour from London, 30 miles from Hastings. Rainfall in 1912, 38·2 inches, and daily mean of bright sunshine in 1912 4·30 hours. Mean winter temperature 41·3° F., summer 55·0° F. Lies upon a bed of sandstone. Climate is tonic and invigorating. Prevailing winds W. and S.W.

Water.—Chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic indications.—Diseases of respiratory organs (bronchitis, asthma, and phthisis), early cardiac cases, diseases of digestive organs, gout and rheumatoid arthritis, and especially diseases of nervous system (neurasthenia and mental depression), also in convalescence and infantile disorders. Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, Turkish, Russian, vapour and swimming, medicated and electric light. (*See p.* 877).

Nursing.—Mount Ephraim Nursing Home (*See p.* 866).

Hotels.—The Grand Hotel (*See p.* 870), and The Spa Hotel (*See p.* 877).

Woodhall Spa (Lincolnshire).—Built upon ironstone sand, through which the rain percolates very rapidly. Midway between Boston and Lincoln, about 3 hours from London (King's Cross), through carriages 4 p.m. Average rainfall 22½ inches. Air bracing, and uncontaminated, from moors and pine woods. Excellent new water supply.

Water.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders.

Baths.—Recently enlarged. Immersion, shower, undercurrent and local douches; Aix and Vichy douche massage; Nauheim, electric and Schnee baths; Dowsing radiant heat and light baths; nose, throat and eye mineral sprays and douches; Russian and Berthollet vapour; electric ionic and X-ray treatments; massage and Swedish exercises. Particulars, apply Medical Superintendent. (*See also p.* 881).

Hotel.—Victoria Hotel (*See p.* 881).

Helouan, Egypt.—Sixteen miles from Cairo by train, 200 feet above the Nile, which is about three miles from the town. Celebrated for its wonderfully dry and warm yet bracing climate, the amount of sunshine in the winter months, and its convenient position for seeing many of the antiquities of Egypt. The amount of bright sunshine from November to March averages 8·3 hours a day, as against 1·4 in London. The diurnal variations are small, the air is fresh by day and night and very free from dust. The average annual rainfall is about ¾ of an inch.

Waters.—Strong sulphur waters, which are used internally and externally in various ways, but especially in the Helouan Bath, in which massage is given while a stream of water at the desired temperature passes freely through the bath. This water rises at a temperature of 91° F.

Therapeutic indications.—Gout, rheumatism, the various forms of arthritis, fibrositis and neuritis, neurasthenia, chronic nephritis, and for those requiring a dry, warm climate, not relaxing, for the winter months.

Hotels.—The Grand Hotel and Hotel Des Bains (*See p.* lx, lxi) and fully equipped baths (*See p.* lx).

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	Tolmers Square Institute, Drummond St., N.W. [illegible]	*[illegible], M.R.C.P.*, 13, Great Alie Street, E.	Monday, [illegible] Wednesday, [illegible]
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	St. Olave's and St. John's Institute, Tooley St., S.E.	V. A. Jaynes, M.R.C.S., .. [illegible] Road, Bermondsey, S.E.	Wednesday, [illegible] (excepting August and September).
	Royal Free Hospital, Gray's Inn Road, W.C.	Mrs. F. E. Willey, M.D., 1a, Devonshire Street, W.	
Birmingham	.. 144, Hockley Hill	W. H. Line, M.D., 144, Hockley Hill	*
Bristol	.. St. Peter's Hospital	*G. S. Page, L.R.C.P.*, 78, Old Market Street	
Cambridge	.. Addenbrooke's Hospital	Dr. F. Deighton, Hills Road	*
Leeds	.. Leeds General Infirmary	Dr. A. T. [illegible], [illegible], Hyde Park Rd.	*
Liverpool	.. 17, Mulgrave Street ..	*Dr. N. E. [illegible]*, 17, Mulgrave Street	
Manchester	.. St. Mary's Hosp., Whitworth Street West	John Scott, M.D., [illegible] Upper Brook Street	*
Newcastle	.. The Dispensary, Nelson St.	*[illegible], M.D.*, 6, Regent Terrace	
Sheffield	.. Jessop Hospital for Women	[illegible], 7, Gladstone Road	*
Cardiff	.. University College	Dr. E. E. Roberts, University College, Old Buildings	
Aberdeen	.. The Public Dispensary	Dr. T. Fraser, 51, Elmbank Terrace	Wednesday, [illegible]
Dundee	.. Royal Infirmary	R. C. Buist, M.D., .. 166, Nethergate	.. Monday, [illegible]
Edinburgh	[illegible]	*J. B. Buist, M.D.*, 1, Clifton Terrace	[illegible]
	[illegible]	W. G. A. Robertson, M.D., [illegible]	[illegible]
Glasgow	[illegible]	Dr. H. H. Borland, [illegible]	[illegible]
	The Western Infirmary	[illegible], M.A., M.B. [illegible]	[illegible]
Belfast	.. City of Belfast Union Infirm.	Dr. J. [illegible], [illegible]	*
Cork	Cork District Hospital	[illegible], M.D. [illegible]	*
Dublin	45, Upper Sackville Street ..	Dr. [illegible], [illegible]	Tuesday, Friday, [illegible]
Galway	[illegible]	Dr. M. J. [illegible], [illegible]	*

(a) [illegible] * [illegible]

MEDICAL AND SCIENTIFIC SOCIETIES.

Abernethian Society—St. Bartholomew's Hospital, E.C.
Esculapian Society—Metropolitan Hospital, Kingsland Road, N.E.
Anatomical Society of Great Britain and Ireland—Secretary, Alex Macphail, M.B., St. Bartholomew's Hospital, E.C.
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Association of Registered Medical Women—Sec., 10, Warltersville Road, N.
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Imperial Vaccination League—53, Berners Street, W.
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Life Assurance Medical Officers' Association—Sec., 73, Cheapside, E.C.
Linnæan Society of London—Burlington House, Piccadilly, W.
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London and Counties Medical Protection Society, Lim.—32, Craven St., W.C.
London Dermatological Society—49, Leicester Square, W.C.
London Hospital Medical Society—Mile End, E.
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Royal Society of Medicine—1, Wimpole Street, W., incorporated by Royal Charter, 1907, and embracing the following Sections: Anæsthetical—Balneological and Climatological—Children's Diseases—Clinical—Dermatological—Electro-Therapeutical—Epidemiological and State Medicine—Historical—Laryngological—Medical—Neurological—Obstetrical and Gynæcological—Odontological—Ophthalmological—Otological—Pathological—Psychiatry—Surgical—Therapeutical and Pharmacological—Tropical Medicine.
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Society for the Study of Inebriety—Hon. Sec., [illegible], Harley Street, W.
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Tuberculosis Society—Sec., 35, Stepney Green, E.
United Services Medical Society—Royal Army Medical College, Grosvenor Road, S.W.
West London Medico-Chirurgical Society—West London Hospital, W.
Zoological Society of London—Outer Circle, Regent's Park, N.W.

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Annals of Surgery—Monthly 2/-—Cassell & Co. Lim., Ludgate Hill, E.C.
Bacteriology, Protozoology and General Parasitology, Review of—Six times per annum [illegible], Whitefriars Street, E.C.
Birmingham Medical Review—Monthly 1/-; 10/- per annum—Percival Jones, Lim., 148–149, Great Charles Street, Birmingham.
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Bristol Medico-Chirurgical Journal—Quarterly 1/6—Arrowsmith, Bristol.
British Medical Journal—Weekly 6d.—429, Strand, W.C.
Burdett's Hospitals and Charities—Yearly 10/6—28 & 29, Southampton Street, W.C.
Caledonian Medical Journal—Quarterly 1/-—A. Macdougall, Mitchell Street, Glasgow.
Charing Cross Hospital Gazette—Quarterly, 2/6 per annum—Charing Cross Hospital, Chandos Street, W.
Chemical World—Monthly 6d.—[illegible], Great Marlborough Street, W.
Child, The—Monthly 1/-—Bale, 83–91, Great Titchfield Street, W.
Children's Diseases, British Journal of—Monthly 1/-—Adlard & Son, 23, Bartholomew Close, E.C.

Clinical Journal—Weekly 3d.—Adlard & Son, Bartholomew Close, E.C.
Dental Directory—Yearly 3/6—Bale, 83–91, Great Titchfield Street, W.
Dental Journal, British—1st and 15th, 6d.—19, Hanover Square, W.
Dental Record—Monthly, 7/6 per annum—17, Newman Street, W.
Dental Science, British Journal of—Monthly, 14/- per annum—Bale, 83–91, Great Titchfield Street, W.
Dental Surgeon—Weekly 3d., 13/- per ann.—Baillière, 8, Henrietta St., W.C.
Dental Surgeon's Daily Diary and Appointment Book—Yearly 5/-, or 6/6—Bale, 83–91, Great Titchfield Street, W.
Dentists' Register—Yearly 3/4—Constable, 10, Orange Street, W.C.
Dermatology, British Journal of—Monthly 2/-; 21/- per annum—H. K. Lewis, 136, Gower Street, W.C.
Dublin Journal of Medical Science—20/- per ann.—41, Grafton St., Dublin.
Edinburgh Medical Journal—Monthly 2/-—W. Green & Sons, Edinburgh.
Glasgow Medical Journal—Monthly 2/-—A. Macdougall, Mitchell St., Glasgow.
Guy's Hospital Gazette—Fortnightly 6d.; 7/6 per annum—Ash & Co. Lim., Henry Street, Bermondsey, S.E.
Guy's Hospital Reports—Yearly 10/6—7, Great Marlborough Street, W.
Heart: A Journal for the Study of the Circulation—Quarterly, 20/- per annum—7, Fetter Lane, E.C.
Homœopathic Journal, British—Monthly 1/-—Bale, 83–91, Great Titchfield Street, W.
Homœopathic World—Monthly 6d.—12, Warwick Lane, E.C.
Hospital—Weekly 1d.; 6/6 per annum—28, 29, Southampton Street, W.C.
Hygiene, Journal of—Quarterly, 21/- per volume—Fetter Lane, E.C.
Indian Medical Gazette—Monthly, 19/- per annum—Thacker & Co., 2, Creed Lane, E.C.
Inebriety, British Journal of—Quarterly 1/-—Baillière, 8, Henrietta St., W.C.
Lancet—Weekly 6d.—423, Strand, W.C.
Laryngology, Rhinology, and Otology, Journal of—Monthly 2/-; 20/- per annum—Adlard & Son, 23, Bartholomew Close, E.C.
Laryngoscope, The—Monthly, 25/- per ann.—Baillière, 8, Henrietta St., W.C.
Liverpool Medico-Chirurgical Journal—Half-yearly, 2/6 each—H. K. Lewis, 136, Gower Street, W.C.
London Hospital Gazette—6/- per annum—5, Rupert Street, E.
Medical Annual—Yearly 8/6 net—John Wright & Sons Lim., Bristol
Medical Chronicle—Monthly 1/6—University Press, Manchester
Medical and Dental Students' Register—Yearly, 2/6—Constable, 10, Orange Street, W.C.
Medical Directory—Yearly 15/- net—Churchill, 7, Great Marlborough St., W.
Medical Magazine—Monthly 1/-—44, Bedford Row, W.C.
Medical Officer—Weekly 4d.; 15/- per annum—30-38, Whitefriars Street, E.C.
Medical Press and Circular—Weekly 5d.; 21/- per annum—Baillière, 8, Henrietta Street, W.C.
Medical Register—Yearly 10/6—Constable, 10, Orange Street, W.C.
Medical Review—Monthly 1/6—70, Finsbury Pavement, E.C.
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Medical World—Weekly 1d.—47, Fleet Street, E.C.
Mental Science, Journal of—Quarterly 5/-—7, Great Marlborough Street, W.
Microscopical Science, Quarterly Journal of—10/-—J. & A. Churchill, 7, Great Marlborough Street, W.
Middlesex Hospital Journal—5/- per annum—140, Wardour Street, W.
Midland Medical Journal—Monthly 4d.—128, Edmund Street, Birmingham.
Midwives' Record and Maternity Nurses' Magazine—Monthly 2d.—Baillière, 8, Henrietta Street, W.C.
Midwives' Roll—Yearly 10/6—Spottiswoode & Co., 5, New Street Sq., E.C.
Mind—Quarterly 4/-—Macmillan & Co. Lim., St. Martin's Street, W.C.
National Dental Hospital Gazette—Monthly from Oct. to March, 3/- per annum—Bale, 83–91, Great Titchfield Street, W.

Neurology and Psychiatry, Review of—25/- per annum—20, South Frederick Street, Edinburgh.

New York Medical Journal—Weekly 6d.—66, West Broadway, New York.

New York Medical Record—Weekly 6d.—Wm. Wood & Co., 51, Fifth Avenue, New York.

Nursing Mirror and Midwives' Journal—Weekly, 1d.—28 and 29, Southampton Street, W.C.

Nursing Times—Weekly 1d.—Macmillan & Co. Lim., St. Martin's St., W.C.

Obstetrics and Gynæcology of the British Empire, Journal of—Monthly 2/6—Sherratt & Hughes, 33, Soho Square, W.

Ophthalmic Hospital Reports, The Royal London—At intervals 7/6—J. & A. Churchill, 7, Great Marlborough Street, W.

Ophthalmic Review—Monthly 1/-—33, Soho Square, W.

Ophthalmological Society's Transactions—Yearly 12/6—J. & A. Churchill, 7, Great Marlborough Street, W.

Ophthalmoscope—Monthly 2/-—Pulman & Sons Lim., 24, Thayer Street, W.

Parasitology—Quarterly, 30/- per annum—Cambridge University Press, Fetter Lane, E.C.

Pathology and Bacteriology, Journal of—Quarterly, 21/- per annum—Pathological Laboratory, Medical Schools, Cambridge.

Pharmaceutical Journal—Weekly 6d.—72, Great Russell Street, W.C.

Pharmacy, Year Book of—Yearly 10/-—7, Great Marlborough Street, W.

Physiology, Journal of—Quarterly, 21/- per volume—Fetter Lane, E.C.

Polyclinic—Monthly 6d.—Bale, 83-91, Great Titchfield Street, W.

Practical Dietetics and Bacterio-Therapeutics, Journal of—Monthly, 5/- per annum—Bale, 83-91, Great Titchfield Street, W.

Practitioner—Monthly 2/6, 25/- per annum—2, Howard Street, Strand, W.C.

Prescriber—Monthly 1/-, 10/- per annum—137, George Street, Edinburgh.

Progressive Medicine—Quarterly 12/-—20 and 21, Bedford Street, W.C.

Psychology, British Journal of—Occasionally 15/-—Cambridge University Press, Fetter Lane, E.C.

Public Health—Monthly 1/6—1, Upper Montague Street, W.C.

Public Health, Journal of the Royal Institute of—Monthly 2/-—37, Russell Square, W.C.

Quarterly Journal of Medicine—Quarterly, 8/6—Oxford University Press, Amen Corner, E.C.

R.A.M.C., Journal of the—Monthly 2/-—Bale, 83-91, Great Titchfield St., W.

Röntgen Ray, Archives of the—Monthly 1/8, 16/- per annum—20 and 21, Bedford Street, W.C.

Röntgen Society, Journal of the—Quarterly 4/-—Smith & Ebbs Lim., Northumberland Alley, Fenchurch Street, E.C.

Royal Dental Hospital Reports—Quarterly, 5/- per annum—Bale, 83-91 Great Titchfield Street, W.

Royal Microscopical Society, Journal of the—Bi-Monthly 6/-—Williams and Norgate, 14, Henrietta Street, W.C.

Royal Sanitary Institute, Journal of the—Monthly 1/-—12 Long Acre, W.C.

Royal Society of Medicine, Proceedings of the—Parts 7/6 each—Longmans Green & Co., 39, Paternoster Row, E.C.

Sanitary Record—Weekly 3d., 14/- per ann.—35-36, Chancery Lane, W.C.

School Hygiene—Quarterly, 4/6 per ann.—Adlard, Bartholomew Close, E.C.

South African Medical Record—Fortnightly, 1/-, 21/- per annum—Baillière, 8, Henrietta Street, W.C.

St. Bartholomew's Hospital Journal—Monthly 6d.—Students' Union, St. Bartholomew's Hospital, E.C.

St. George's Hospital Gazette—Monthly 6d.—83-91, Great Titchfield St., W.

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St. Thomas's Hospital Reports—Yearly 8/6—7, Great Marlborough Street, W.

State Medicine, Journal of—Monthly, 2/-—Bale, 83-91, Gt. Titchfield St., W.

Surgery, British Journal of—Quarterly 7/6 net, 25/- per annum—John Wright & Sons Ltd., Bristol.

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Therapist, The—Monthly 6d.; 5/- per annum—Henderson & Spalding, Sylvan Grove, Old Kent Road, S.E.

Tropical Diseases Bulletin—Fortnightly 1/6—Baillière, 8, Henrietta Street, W.C.

Tropical Life—Monthly 1/-—Bale, 83–91, Great Titchfield Street, W.

Tropical Medicine and Hygiene, Journal of—Fortnightly 1/-; 18/- per annum—Bale, 83–91, Great Titchfield Street, W.

Tropical Medicine and Hygiene, Transactions of the Society of. Eight numbers yearly, 3/6 net each—H. K. Lewis, 136, Gower Street, W.C.

Tuberculosis, British Journal of—Quarterly 1/6—Baillière, 8, Henrietta Street, W.C.

Tuberculosis Year Book and Sanatoria Annual—Yearly 7/6—Bale, 83-91, Great Titchfield Street, W.

Universal Medical Record—Monthly, 25/- per annum—36-38, Whitefriars Street, E.C.

University College Hospital Magazine—Monthly, Oct. to March, 1/-—Bale, 83-91, Great Titchfield Street, W.

Vaccine Therapy, Journal of—Monthly 1/-; 10/6 per annum—H. K. Lewis, 136, Gower Street, W.C.

West London Medical Journal—Quarterly 1/-—23, Bartholomew Close, E.C.

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Bale, John Sons & Danielsson Lim., 83-91, Great Titchfield St., W.
Butterworth & Co., Bell Yard, Temple Bar, W.C.
Cambridge University Press (C. F. Clay), 133-137, Fetter Lane, E.C.
Cassell & Co. Lim. La Belle Sauvage, Ludgate Hill, E.C. (and Printers).
Churchill, J. & A., 7, Great Marlborough Street, W.
Cornish Bros. Lim., 37, New Street, Birmingham
Fannin & Co. Lim., Grafton Street Dublin
Glaisher, H. J., 57, Wigmore Street, W.
Green, Wm. & Sons, St. Giles Street, Edinburgh
Griffin, Chas. & Co. Lim., 12, Exeter Street, Strand, W.C.
Heinemann, William (Successor to Rebman Lim.), 20 and 21, Bedford Street, W.C.
Hilton & Co., 109, College Street, Calcutta, India.
Kimpton, Henry (Hirschfeld Bros. Lim.), 263, High Holborn, W.C.
Lewis, H. K., 136, Gower Street, W.C.
Lippincott, J. B. Co., 16, John Street, Adelphi, W.C.
Livingstone, E. & S., Teviot Place, Edinburgh
Longmans, Green & Co., 39, Paternoster Row, E.C.
Maclehose, J. & Sons, 61, St. Vincent Street, Glasgow
Macmillan & Co. Lim., St. Martin's Street, W.C.
Medical Publishing Co. Lim., 23, Bartholomew Close, E.C.
Methuen & Co. Lim., 36, Essex Street, W.C.
Murray, John, Albemarle Street, W.
Nisbet, Jas. & Co. Lim., 22, Berners Street, W.
Oxford Medical Publications (Henry Frowde and Hodder & Stoughton), Falcon Square, E.C.
Saunders, W. B. Co., 9, Henrietta Street, W.C.
Scientific Press Lim., 28 and 29 Southampton Street, W.C.
Sherratt & Hughes, University Press, 34, Cross Street, Manchester
Simpkin, Marshall, Hamilton, Kent & Co. Lim., Stationers' Hall Court and Paternoster Row, E.C.
Smith, Elder & Co., 15, Waterloo Place, S.W.

Thacker, W. & Co., 2, Creed Lane, E.C. (Thacker, Spink & Co., Calcutta)
Wright, John & Sons Lim., Bristol (and Printers) ; London Depot, 4, Stationers' Hall Court, E.C.

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Alexander & Fowler, 104, Pembroke Place, Liverpool
Allen & Hanburys Lim., 48, Wigmore Street, W., and Lombard Street, E.C.
Arnold & Sons, Giltspur Street, E.C.
Bailey, W. H. & Son, 38, Oxford Street, W.
Barth, Geo. & Co., 54, Poland Street, Oxford Street, W. (Inhalers).
Browne & Sayer, 30, Highbury Place, N.
Clarke, John & Co. (Successors) Lim., 8, Donegall Square West, Belfast
Coles, William & Co., 5, Sackville St., Piccadilly, W. (Trusses)
Critchley, J. & Sons, 18, Great George Street, Liverpool
Domen Belts Co. Lim., 456, Strand, W.C. (Belts, Trusses, etc)
Down Bros. Lim., 21 & 23, St. Thomas's Street, S.E.
Evans, Madame, 11a, Orchard Street, Portman Square, W. (Surgical Corsets and Belts)
Fannin & Co. Lim., Grafton Street, Dublin
Ferris & Co. Lim., Bristol
Gardner, J. & Son, 32, Forrest Road, Edinburgh
Grossmith, W. R., 110, Strand, W.C.
Harris, Philip & Co. Lim., Edmund Street, Birmingham
Hawksley & Sons, 357, Oxford Street, W.
Haywood, J. H. Lim., Castle Gate, Nottingham
Hearson, Chas. & Co. Lim., 235, Regent Street, W. (Incubators)
Holborn Surgical Instrument Co. Lim., 26, Thavies Inn, E.C.
Holden Bros., 3, Harewood Place, Oxford Street, W. (Footwear)
Holland & Son, 46, South Audley Street, W. (Foot Supports)
Hospitals & General Contracts Co. Lim., 25-35, Mortimer Street, W.
Krohne & Sesemann, 37, Duke Street, W.
Maw, S., Son & Sons, 7 to 12, Aldersgate Street, E.C.
Mayer & Meltzer, 71, Great Portland Street, W.
Medical Enterprise Society Lim., 25, Palace Chambers, Westminster, S.W.
Medical Supply Association, 167–173, Gray's Inn Road, W.C.
Millikin & Lawley, 165, Strand, W.C.
Montague, J. H., 69, New Bond Street, W.
Mottershead & Co., 7, Exchange St., Manchester
Reynolds & Branson Lim., 13, Briggate, Leeds
Rogers, F. A., 327, Oxford Street, W.
Salt & Son Lim., 7, Cherry Street, Birmingham
Sumner, R. & Co. Lim., Lord Street, Liverpool
Surgical Manufacturing Co., 85, Mortimer Street, W.
Teske, C. A., Ltd., 33, Percy Street, W.
Thackray, Chas. F., 66–70, Great George Street, Leeds
Weiss, John & Son Lim., 287, Oxford Street, W.
Wood & Blake, 78, King Street, Manchester
Woolley, Jas. Sons & Co. Lim., Victoria Bridge, Manchester
Young, Archibald & Son, 57–61, Forrest Road, Edinburgh

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Ferris & Co. Lim., Bristol
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Renner's (Dr.) Establishment, 75, Upper Gloucester Place, N.W.
Roberts & Co. (Dr. Chaumier's), 76, New Bond Street, W.

NOTE BOOK.

It is easier to make a note of a thing than to remember *where* the note was made. The following pages are indexed under their respective headings, and any note can be immediately found when required.

NOTES.

Copy here any formula or fact you wish to keep for reference. (These pages are indexed under the word "Notes.")

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SEE PAGE lxxvii.

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INDEX TO LIFE ASSURANCE OFFICES.

A, *when Established*; B, C, D, *Annual Premiums to Insure £100 on death, with Profits, at the ages of 30, 40, and 50*; E, *Assurance and Annuity Funds, exclusive of Paid-up Capital.* M, *Mutual Offices*; P, *Proprietary Offices.*

Those marked with an asterisk (*) in the E column have not sent revised figures for 1913.

TITLE, ETC., OF OFFICE.	A	B	C	D	E
					£
Abstainers and General Insurance Co., Ltd., Edmund St., Birmingham. *Act. & Sec.*, R. A. Craig A.I.A. .. .. P	1883	40/11	55/10	82/3	699,695
Alliance Assurance Co. Ltd., Bartholomew Lane, E.C. *Gen. Man.*, Robert Lewis P	1824	48/9	64/5	90/9	7,343,477
Atlas Assurance Co. Ltd., 92, Cheapside, E.C. *Act.*, Robert Cross. *Gen. Man.*, Saml. J. Pipkin .. .. P	1808	49/3	63/7	88/8	2,202,329
Australian Mutual Provident Society, Life, Endowments and Annuities, 37, Threadneedle Street E.C., *Res. Sec.*, A. C. Hollingworth. **Further particulars see page 803** .. .. .. M	1849	48/2	64/5	89/10	[illegible],007,658
Britannic Assurance Co. Ltd., Life, Endowment Assurances, House Purchase, Broad Street Corner, Birmingham. *Chairman*, F. T. Jefferson, J.P. *Secretary*, J. A. Jefferson, F.I.A. **Further particulars see page 802** .. .. P	1866	48/6	65/2	94/-	3,300,000
British Equitable Assurance Co. Ltd., 1, 2, 3, Queen Street Place, E.C. *Manager*, Basil May, F.I.A. .. .. .. P	1854	48/8	64/11	91/9	1,663,364
Caledonian Insurance Co., 19, George Street, Edinburgh. *Gen. Man.*, Robert Chapman. London Offices, 82, King William Street, E.C., and 14, Waterloo Place, S.W. P	1805	48/9	64/6	88/6	3,147,665
Canada Life Assurance Co., 15, King Street, Cheapside, E.C. *Man.*, A. D. Cheyne P	1847	48/0	65/10	90/8	9,608,711
City of Glasgow Life Assurance Co., 30, Renfield Street, Glasgow. *Gen. Man.*, William S. Nicol. London Office, 12, King William St., E.C. *London Man.*, L. Campbell P	1838	48/9	64/6	89/6	3,174,803
City Life Assurance Co. Ltd., 6, Paul Street, Finsbury, E.C. *Man. Director*, M. Gregory	1897	44/1	60/11	89/7	*463,385
Clergy Mutual Assurance Society, Life, 2 & 3, Sanctuary, Westminster. *Act. and Man.*, F. B. Wyatt. *Sec.*, W. N. Neale. **Further particulars see page 801** M	1829	46/4	62/2	87/4	4,676,274
Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, and 1, King William Street, E.C. *Act. & Sec.*, A. D. Besant .. .. .. P	1824	48/7	66/9	90/3	*5,468,071
Colonial Mutual Life Assurance Society Ltd., 33, Poultry, E.C. *Man.*, Arthur E. Gibbs. *Sec.*, W. N. Dewar .. .. M	1873	47/4	63/2	89/9	3,500,000
Commercial Union Assurance Co. Ltd., 24, 25, and 26, Cornhill, E.C. *Act.*, A. G. Allen P	1861	47/10	65/2	92/4	5,181,487
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. *Sec.*, James Odgers. **Further particulars see page 804** .. .. .. P	1867	47/4	[illegible]	90/1	*203,606
Eagle Insurance Co., 79, Pall Mall, S.W. *Man. & Act.*, F. B. Galer, B.A., F.I.A. *Sec.*, J. F. E. Hall .. .. P	1807	48/7	64/5	89/10	2,066,220
Edinburgh Life Assurance Co., 26, George Street, Edinburgh. *Man.*, T. M. Gardiner. *Sec. & Act.*, A. E. Sprague, D.Sc., F.F.A., F.I.A. London, 3, Birchin Lane, E.C. *Sec.*, J. J. Bisgood .. .. .. P	1823	47/11	64/2	90/2	4,334,221
English and Scottish Law Life Assurance Association, 33, St. James's Square, S.W. *Gen. Man.*, Albert G. Scott. *Act. & Sec.*, John Spencer, F.I.A. .. .. P	1839	47/1	62/8	87/9	3,030,678

A, year of Foundation; B, C, D, Annual Premiums to Assure £100 on death with Profits, at the age of 20, 30, and 40. F, Insurance and Annuity Funds, exclusive of Paid-up Capital. M, Mutual Offices; P, Proprietary Offices.

Those marked with an asterisk (*) in the F column have not sent revised figures for [illegible].

Title, Add., and Officers	A	B	C	D	F
Equitable Life Assurance Society, Mansion House Street, E.C. *Act. & Man.*, W. P. Elderton. M	1762	[illegible]	[illegible]	[illegible]	[illegible]
Equity and Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. *Act. & Sec.*, W. P. Phelps, M.A., F.I.A. P	1844	47/10	64/6	[illegible]	*4,7[illegible]
Friends' Provident Institution, Bradford, Yorkshire. *Sec.*, William H. Gregory. *Act.*, [illegible], F.I.A. .. M	1832	48/-	64/-	89/7	[illegible]
General Accident Fire and Life Assurance Corporation Ltd., Perth, Scotland. *Gen. Man.*, F. Norie-Miller, J.P. .. P	[illegible]	[illegible]	64/11	[illegible]	[illegible]
General Life Assurance Co., [illegible] Cannon Street, E.C. *Man. & Sec.*, John Robert [illegible]. Further particulars see page [illegible] P	1837	49/10	[illegible]	92/8	[illegible]
Gresham Life Assurance Society Ltd., St. Mildred's House, E.C. *Man. & Sec.*, Alexander Lawson. .. .. P	1848	48/2	64/1	[illegible]	10,2[illegible]
Guardian Assurance Co. Ltd., 11, Lombard Street, E.C. and 21, Fleet Street. *Sec.*, T. G. C. Browne. *Act.*, Ernest Woods P	1821	[illegible]	64/6	[illegible]	[illegible]
Law Union and Rock Insurance Co. Ltd., Old Serjeants' Inn, Chancery Lane. *Gen. Man.*, R. Stirling. .. .. P	1806	48/4	64/-	89/10	*7,818,008
Legal & General Life Assurance Society, 10, Fleet St., E.C. *Act. & Man.*, [illegible] Colquhoun P	[illegible]	[illegible]	65/11	[illegible]	*[illegible]
Life Association of Scotland, 82, Princes St., Edinburgh. *Man.*, [illegible]. *Sec.*, [illegible]. London Office, [illegible], E.C. *Sec.*, [illegible] P	[illegible]	48/11	[illegible]	[illegible]	[illegible]
Liverpool and London and Globe Insurance Co. Ltd., 1, Dale Street, Liverpool. *Gen. Man. & Sec.*, A. G. Dent. London Office, 1, Cornhill, E.C. .. .. P	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
London and Lancashire Life and General Assurance Association Ltd., 66, 67, Cornhill, E.C. [illegible] Louis I. Jarvis. *Jnt. Asst. Secs.*, E. E. Dent and L. C. Kestin. *Act.*, Harold Dougharty, A.I.A., F.C.I.S. .. .. P	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
London Assurance Corporation, 7, Royal Exchange, E.C. *Man.* of Life Dept., James Clunes. *Act.*, A. G. Hemming .. P	1720	[illegible]	[illegible]	[illegible]	2,580,124
London Life Association, Ltd., 81, King William Street, E.C. *Act. & Man.*, [illegible], M.A., F.I.A. M	[illegible]	60/-	[illegible]	[illegible]	[illegible]
[illegible] Society, 14, Leadenhall Street, E.C. *Act.* [illegible] M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] Moorgate Street, E.C. *Sec.*, Bernard Woods. [illegible] M	[illegible]	[illegible]	[illegible]	92/-	[illegible]
Mutual Life and Citizens' Assurance Co. Ltd. [illegible] P	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] M	[illegible]	48/4	[illegible]	[illegible]	3,040,849
National Mutual Life Association of Australasia Ltd., [illegible] Further particulars see page [illegible] M	[illegible]	[illegible]	[illegible]	[illegible]	*[illegible]
[illegible] M	[illegible]	[illegible]	66/3	[illegible]	[illegible]

A, when Established; B, C, D, Annual Premiums to Insure £100 at death, with Profits, at the age of 30, 40, and 50; E, Assurance and Annuity Funds, exclusive of Paid-up Capital. M, *Mutual Offices;* P, *Proprietary Offices.*

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TITLE, ETC., OF OFFICE.	A	B	C	D	E
New York Life Insurance Co., Trafalgar Buildings, Trafalgar Square, London, W.C. *Sec.*, Wm. R. Collinson, F.C.I.S. .. M	1845	48/9	66/-	90/11	£ 147,879,800
North British and Mercantile Insurance Co., Fire, Life, Annuities, 61, Threadneedle St., E.C., and 64, Princes St., Edinburgh. *Life Man. & Act.*, London, H. Cockburn. *Home Fire & Jt. Life Man.*, D. C. Haldeman. *Sec.*, R. Carmichael. West End Office, 7, Waterloo Place, S.W. *Man.*, D. C. Haworth-Booth. **Further particulars see page cxxii** . P	1809	49/10	66/1	91/11	15,645,125
Northern Assurance Co. Ltd., 1, Moorgate Street, E.C. *Gen. Man.*, H. E. Wilson P	1836	49/-	64/8	90/10	5,259,609
Norwich Union Life Insurance Society, Norwich. *Gen. Man. & Act.*, Davidson Walker. London Office, 49, Fleet St., E.C.	1808	45/8	59/6	85/3	11,600,178
Pearl Life Assurance Co. Ltd., High Holborn, W.C. *Jnt. Man'g Directors*, F. D. Bowles, Esq., J.P., C.C., and G. Shrubsall, J.P. P	1864	49/-	65/-	92/-	7,845,442
Phœnix Assurance Co. Ltd., 19 & 70, Lombard Street, 57, Charing Cross, and 187, Fleet Street, E.C. *Gen. Man.*, Sir Gerald H. Ryan, F.I.A. .. .. P	1782	48/11	64/7	90/8	*10,360,677
Provident Clerks & General Mutual Life Assurance Association, 27 & 29, Moorgate St., E.C. *Sec.*, John E. Gwyer M	1840	46/4	62/8	92/2	2,890,726
Prudential Assurance Co. Ltd., Holborn Bars. *Jnt. Secs.*, D. W. Stable and J. Smart **Further particulars see page 803** P	1848	49/6	65/11	91/11	44,504,184
Refuge Assurance Co. Ltd., Oxford Street, Manchester. *Joint Mans.*, Philip Smith and James S. Proctor. London Office, 133, Strand, W.C. .. .. .. P	1864	49/3	65/9	91/9	[illegible]
Royal Exchange Assurance Corporation, Royal Exchange, E.C., and 44, Pall Mall, S.W. *Act.*, H. E. Nightingale, F.I.A. P	1720	49/-	64/9	90/2	[illegible]
Royal Insurance Co. Ltd., 1, North John St., Liverpool. *Man.*, G. Chappell. London Offices, 24-28, Lombard Street. *Sec.*, R. M'Connell .. .. .. P	1845	48/8	64/4	90/4	10,950,488
Sceptre Life Association Ltd., 40, Finsbury Pavement, E.C. *Sec.*, W. E. Wright P	1864	48/8	64/8	90/6	[illegible]
Scottish Amicable Life Assurance Society, St. Vincent Place, Glasgow. *Man.*, W. Hutton. *Sec.*, C. Guthrie .. M	1826	51/9	66/3	90/1	[illegible]
Scottish Equitable Life Assurance Society, 28, St. Andrew Square, Edinburgh. *Man. & Act.*, G. M. Low. *Sec.*, J. J. McLauchlan. London Office, 13, Cornhill, E.C. *Sec.*, P. W. Purves. .. .. M	1831	50/-	65/5	90/6	6,110,323
Scottish Life Assurance Co. Ltd., 19, St. Andrew Square, Edinburgh. *Man.*, Sir David Paulin, F.R.S.E. London Office, 13, Clements Lane, E.C. *Sec.*, Geo. Struthers P	1881	49/5	64/6	90/5	[illegible]
Scottish Metropolitan Life Assurance Co. Ltd., 25, St. Andrew Square, Edinburgh. London Office, 66, 67, Cornhill, E.C. *Sec.*, F. S. Goggs .. .. .. P	1876	40/8	54/7	79/7	*344,584
Scottish Provident Institution, 6, St. Andrew Square, Edinburgh. *Man.*, J. G. Watson. *Sec.*, R. T. Boothby. *Joint Asst. Secs.*, C. W. Thomson & Jas. C. Lindsay. *Act.*, W. G. Walton. London Offices, 3, Lombard St., E.C., and 17, Pall Mall, S.W. .. M	1837	42/4	56/6	83/2	[illegible]
Scottish Temperance Life & Accident Insurance Co., Ltd., 109, St. Vincent Street, Glasgow. *Manager*, Adam K. Rodger. London, 2, 3 & 4, Cheapside. *Man.*, W. A. Bowie. ***Less 10 per cent to Whole Life Abstainers*** P	1883	48/6	63/9	89/10	1,946,441

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Those marked with an asterisk (*) in the E column have not sent revised figures for [illegible].

Title, Etc., of Office.	A	B	C	D	E
					£
Scottish Union & National Insurance Co., 35, St. Andrew Square, Edinburgh. Gen. Man., J. A. Cook. London Office, 3, Walbrook, E.C. *Sec.*, James G. Nicoll .. P	1824	[illegible]	[illegible]	[illegible]	[illegible]
Scottish Widows' Fund Life Assurance Society, 9, St. Andrew Square, Edinburgh. *Man. & Act.*, G. J. Lidstone. *Sec.*, J. G. C. [illegible]. London Offices, 28, Cornhill, E.C., and 5, Waterloo Place, S.W. *Sec.*, R. [illegible] M	1815	[illegible]	[illegible]	[illegible]	*[illegible]
Standard Life Assurance Co., 3, George Street, Edinburgh. *Man.*, Leonard W. Dickson. London Offices, 83, King William St., and 3, Pall Mall East. [illegible] P	1825	[illegible]	[illegible]	[illegible]	[illegible]
Star Assurance Society, 32, Moorgate Street, E.C. *Gen. Man.*, J. Douglas Watson. P	1843	[illegible]	[illegible]	[illegible]	[illegible]
Sun Life Assurance Society, 63, Threadneedle Street, E.C. *Act.*, R. G. Salmon, F.I.A. *Sec. & Gen. Man.*, E. Linnell P	1810	[illegible]	[illegible]	[illegible]	[illegible]
Sun Life Assurance Co. of Canada, Canada House, 4 & 5, Norfolk Street, W.C. *Man.*, J. F. Junkin .. .. .. P	1865	[illegible]	[illegible]	[illegible]	[illegible]
United Kingdom Provident Institution, 196, Strand, W.C. *Sec.*, H. W. Hasler M	1840	[illegible]	[illegible]	[illegible]	[illegible]
University Life Assurance Society, 25, Pall Mall, S.W. *Act. & Sec.*, [illegible], M.A. .. P	1825	49/11	[illegible]	[illegible]	[illegible]
Wesleyan & General Assurance Society, Head Offices, Wesleyan Assurance Buildings, Steelhouse Lane, Birmingham. *Gen. Man.*, [illegible]. London Office, [illegible] Finsbury Pavement, E.C. Further particulars see page 802 .. M	1841	[illegible]	[illegible]	[illegible]	[illegible]
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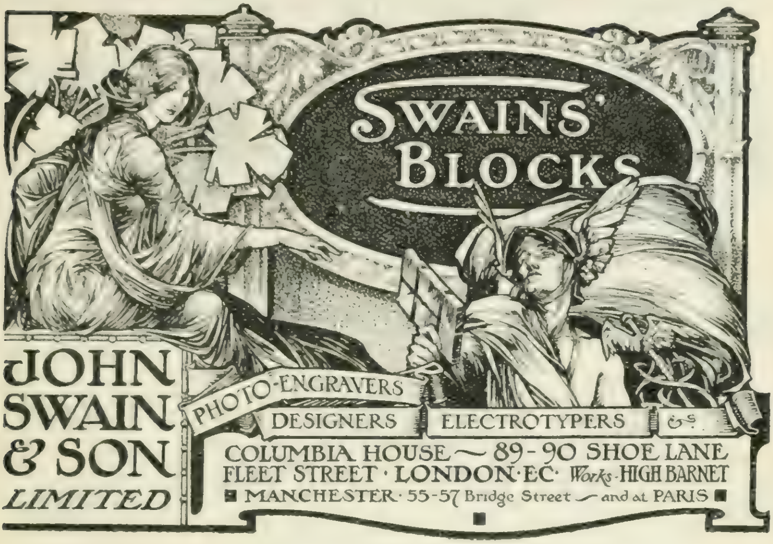

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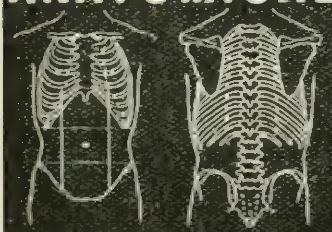

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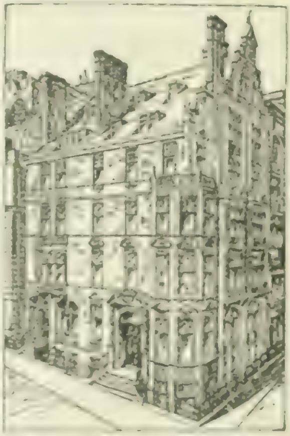

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For further particulars and prospectus apply to the Dean of the Medical Faculty at the University.

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Attendance at the University of Durham College of Medicine during one of the five years of professional study, and subsequently to qualification elsewhere, is required as part of the curriculum for the Degrees, except in the case of Practitioners of more than fifteen years' standing, who have attained the age of forty years, who can obtain the Degree of M.D. after examination only.

The first three Examinations for the Degree of M.B. may be passed prior to the commencement of attendance at Newcastle.

A candidate who has passed the First and Second Examinations of the University will be exempt from the First and Second Examinations of the Conjoint Board in England, and will be entitled to present himself for the Final Examination of the Board on the completion of the necessary curriculum. Students who have satisfied the requirements of the General Medical Council as regards Registration, in some Examination other than the Durham Matriculation, are eligible to enter on a course of study for a degree in Medicine upon satisfying the Examiners of the University of Durham in *three* of the subjects of the Matriculation Examination, [illegible] and Elementary Mathematics, provided that one of them is a language other than English. In the case of a Student who spends only one year at Newcastle, the necessary subjects of the Matriculation Examination must be passed at least 12 months previously to the candidate's entry for his Final Examination for the Degree.

Students can complete, at the University of Durham College of Medicine, Newcastle-upon-Tyne, the entire course of professional study required for the above degrees and for the Diplomas in Public Health and Psychiatry; also for the examinations of the Royal Colleges of Physicians and Surgeons, and for the Army and Navy Examination Boards.

A Dental curriculum is provided, and a Licence in Dental Surgery may be obtained after Examination.

All information, together with Examination Papers, etc., is given in the Calendar of the University of Durham College of Medicine, Newcastle-on-Tyne, which may be obtained gratis from the Secretary at the College.

Scholarships, &c.—University of Durham Scholarship, value £100 for proficiency in Arts awarded annually to full students in their first year only. The Pears Scholarship value £150—for proficiency in Arts. Dickinson Scholarship—value the interest of £400, and a Gold Medal—for Medicine, Surgery, Midwifery, and Pathology. Tulloch Scholarship—value the interest of £400—for Anatomy, Physiology, and Chemistry. Charlton Scholarship—value the interest of £700—for Medicine. Gibb Scholarship—value the interest of £500—for Pathology. Luke Armstrong Scholarship—interest on £680—for comparative Pathology. Stephen Scott Scholarship—interest on £1000—for promoting the study of Surgery and allied subjects. Heath Scholarship—the late George Yeoman Heath, M.D., M.B., D.C.L., F.R.C.S., President of the University of Durham College of Medicine, bequeathed the sum of £4000 to found a Scholarship in Surgery, the interest to be awarded every second year. Gibson Prize—value the interest of £225—for Midwifery and Diseases of Women and Children. The Turnbull Prize and Medal—for Surface Anatomy. The Goyder Memorial Scholarship (at the Infirmary)—value the interest of £325—for Clinical Medicine and Clinical Surgery. At the end of each Session, a Prize of Books is awarded in each of the regular Classes. Assistant Demonstrators of Anatomy, Prosectors, and Assistant Physiologists are elected yearly. Pathological Assistants, Assistants to the Dental Surgeon, Assistants in the Eye Department, Clinical Clerks and Dressers are appointed every three months.

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(*c*) Single courses of Lectures, [illegible] guineas.

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(*f*) Composition fee for courses of instruction for the Diploma in Psychiatry, 25 guineas.

Fees for Lectures, etc., at the College and for Hospital Practice, must be paid to the Secretary; and fees for Practical Dental Work to the Dean of the Dental Hospital—at the time of entry.

Further particulars may be obtained from the Sec., PROF. HOWDEN, at the College.

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Gynæcologists—Dr. A. H. F. Barbour, Mr. N. T. Brewis, Lecturers in Clinical Gynæcology, Edinburgh University.

Assistant Gynæcologists—Dr. J. Haig Ferguson, Dr. William Fordyce, Lecturers in Clinical Gynæcology, Edinburgh University.

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Physicians—Dr. Norman Walker, Dr. Fred Gardiner, Lecturers in Dermatology.

Assistant Physician—Dr. R. Cranston Low.

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Surgeons—Dr. W. G. Sym, Dr. J. V. Paterson, Lecturers in Ophthalmology.

Assistant Surgeons—Dr. A. H. H. Sinclair, Dr. H. M. Traquair.

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Surgeons—Dr. A. Logan Turner, Dr. J. Malcolm Farquharson, Lects. in Ear & Throat Diseases.

Assistant Surgeons—Dr. John S. Fraser, Dr. John D. Lithgow.

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Medical Electricians—Dr. W. Hope Fowler, Dr. [illegible].

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Assistant Pathologists—Dr. James Miller, Dr. A. Murray Drennan, Dr. D. Murray Lyon.

Superintendent—Lieut.-Colonel Sir Joseph Fayrer, Bart., [illegible]

Hospital Tickets.—Perpetual Ticket, by one payment, £[illegible]; Annual Ticket, £[illegible]; Six Months, £[illegible]; Three Months, £[illegible]; One Month, £[illegible]. Separate payments, amounting to £[illegible], entitle the student to a Perpetual Ticket on production of previous annual tickets.

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Students are eligible for any Resident or Surgical Appointments in this Hospital, which are as follows:—

1. Resident Physicians and Surgeons, who must be registered as legally qualified Practitioners, are from time to time appointed by the Managers on the recommendation of the Physicians and Surgeons. The holders of these offices live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period on special recommendation.
2. Non-Resident House Physicians and Surgeons or Clinical Assistants, who must also be duly legally qualified Practitioners, are appointed by the Managers on the recommendation of the Physicians and Surgeons. The appointment is on the same terms as that of the Resident Physicians and Surgeons.
3. Clerks and Dressers are appointed by the Physicians and Surgeons. These appointments are open to all Students and Junior Practitioners holding Hospital Tickets.

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WILLIAM S. CAW, *Treasurer and Clerk.*

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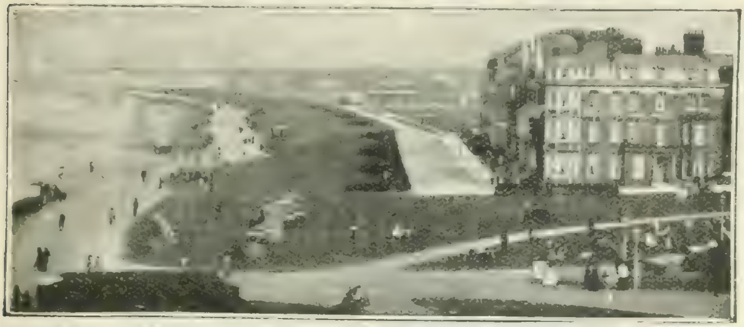

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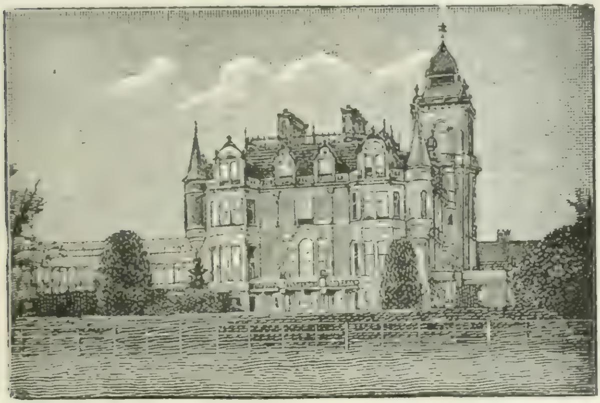

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[illegible] by two Assistant [illegible]

[illegible] golf, [illegible] A library [illegible]

[illegible] of the Patients, and Divine [illegible]

[illegible] The House is heated throughout [illegible]

[illegible] L. & N.W. Railways. It is situated [illegible] Being a watering place, it [illegible] Patients.

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For the Upper and Middle Classes. Founded 1835. Telephone 56.

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[illegible]

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For [illegible] apply to the MEDICAL SUPERINTENDENT.

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Dr. THOMAS *attends at 64, PARK STREET, BRISTOL,*
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TELEPHONE No. 12 WINTERBOURNE.

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THIS [illegible] fire-proof, [illegible]

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[illegible] Terms on application.

For further particulars apply to R. W. HEWSON, L.R.C.P. & S. Ed. (Ed. Univ.) Med. Supt.

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A Registered Hospital for the Care and Treatment of both Sexes of the Upper and Middle Classes, when suffering from Nervous and Mental Disorders.

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The building is arranged so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

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For further particulars, apply to the Medical Superintendent, JAMES NEIL, M.D.

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Physician for Mental Diseases to the Sheffield Royal Hospital.

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 3 from Rotherham) and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Under the New Act Voluntary Patients can be received, without Certificates, on their personal application. The Rev. R. T. C. SLADE, Mus. Bac., Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

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GRANGE LANE STATION (M. S. & L. Railway) is within a quarter of a mile of The Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham, changing at Tinsley.

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GROUVILLE, JERSEY.

MENTAL AND INEBRIATES' HOME FOR LADIES AND GENTLEMEN.

Medical Superintendent—**A. C. STAMBERG, M.D.**

Old established, and delightfully situated in the most healthy and picturesque locality in the Island. Voluntary Boarders received without certificates. **Terms—2 to 6 Guineas a week.**

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HAMPSTEAD, Glasnevin, for Gentlemen HIGHFIELD, Drumcondra, for Ladies.

For the Cure and Care of Patients of the Upper Class suffering from
Mental and Nervous Diseases and the Abuse of Drugs.
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These Hospitals are built on the Villa System, and there are also Cottages on the demesne (154 acres), which is 150 ft. above the sea level and commands an extensive view of the Dublin Mountains and Bay.

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NEAR ARMAGH.

For the CURE and TREATMENT of Ladies and Gentlemen of the Upper and Middle Classes suffering from

MENTAL AND NERVOUS DISEASES.

Voluntary Boarders and Inebriates admitted without Medical Certificates.

The Retreat is beautifully situated in picturesque [illegible] grounds, and Patients enjoy the greatest possible liberty. There is a large proportion of [illegible]

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Private Hospitals for Patients of the Upper Classes suffering from NERVOUS and MENTAL DISEASES, ALCOHOLISM, Etc.

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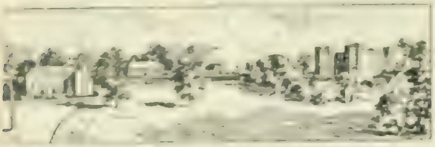

For Mentally Defective Children,
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Apply to Secretary: **National Institutions for Persons requiring Care and Control,**
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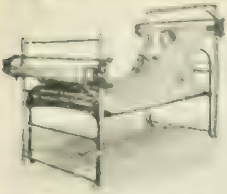
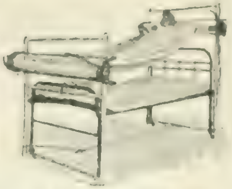
THE SKEFFINGTON.



Sits patient up, changes its sheet.

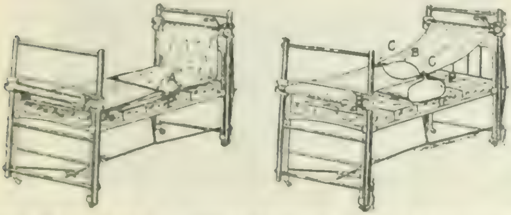
Lifts Sacrum for Changing Draw Sheet



Lift for Making Bed Underneath.

CAN BE HIRED.

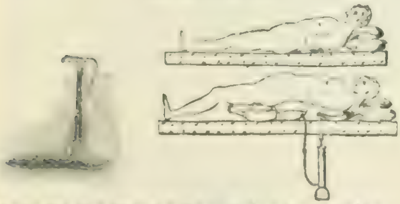
THE ANASTASIA.



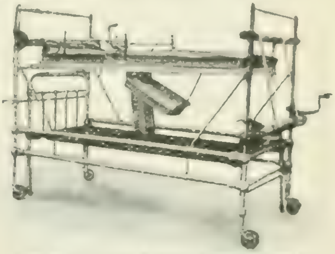
Put the sheet as at A. Fasten the clamps C C. Turn the handles and the sheet assumes the shapes B P, the patient only having to lie still.

Wheels from Bed to Bed

THE SKEFFINGTON LIFTING CUSHION.



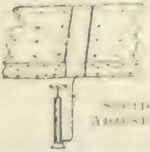
Lifts the Bed Patient in a Wide bed as easily as in a Narrow One



Lifts Patient and gives access to Spine.

THE SKEFFINGTON FRACTURE MATTRESS.

Section Collapsed.



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Highest Award,
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1912

Gold Medal, Vienna.
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Gold Medal, Grand Palm, Paris.

THE SKEFFINGTON INCLINATOR.

Slips on to any bedstead.
Adopted by the
London Hospital.

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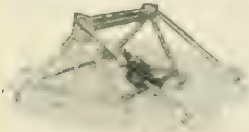
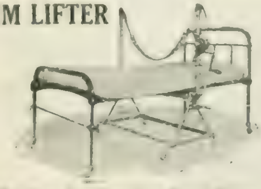


Wheels Under the Bed.



Lifts Sacrum for Changing Draw Sheet.
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The New "Wigmore" Surgeons' and Midwifery Bag

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As suggested by Dr. [illegible]

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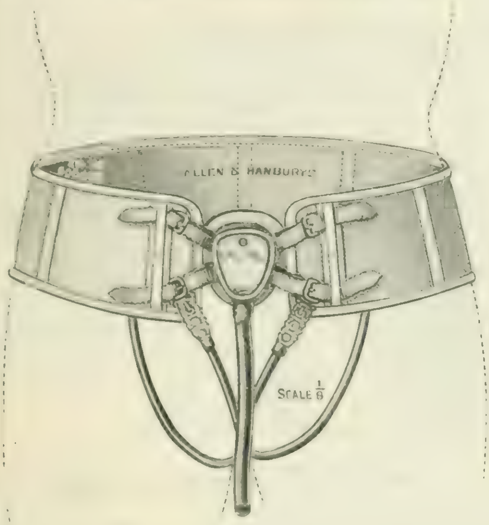

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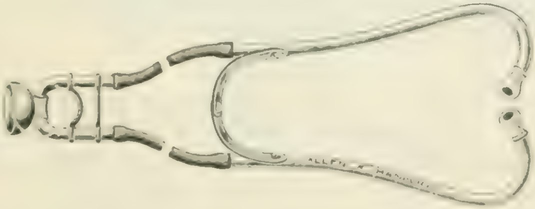
By Going,
of Littlehampton.

Registered Pattern
No. 606095

This apparatus is a great improvement on that invented by Dr. Hamilton Irving. It allows the patient to sit comfortably, prevents any puddle of urine collecting at the bottom of the protector or shield, has only one opening for the rubber tubing instead of two, and the belt and adjustments are much more comfortable.

Complete Apparatus fitted with India rubber Under-straps	...	£1 6 6
Do. do. Tape Under-straps	...	£1 4 0



Copeland's Stethoscope.

Complete with Copeland's Registered Chest Piece 14 6
Localizer for above, 2/6 each.

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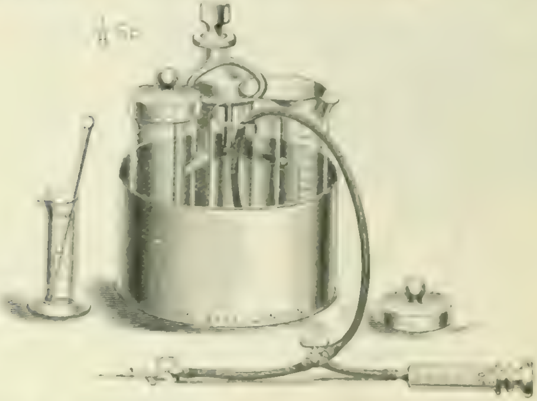
New Portable Outfit for Intravenous Injection of Salvarsan, Neo-Salvarsan, Etc.

Suggested by Mr. A. [illegible], M.R.C.S., Hon. Surg., St. Paul's Hospital



The following advantages are claimed for this compact Outfit:—

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3. The apparatus rests firmly on the bed, and no assistance is required throughout the injection.

PRICE:—

The Complete Outfit, with Sterilizing Drum and Outside Waterproof Cover, **£5 0 0**

If with Platinum Iridium Needle, **3/9** extra.

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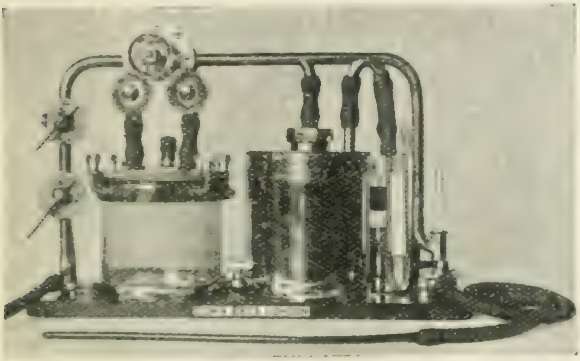

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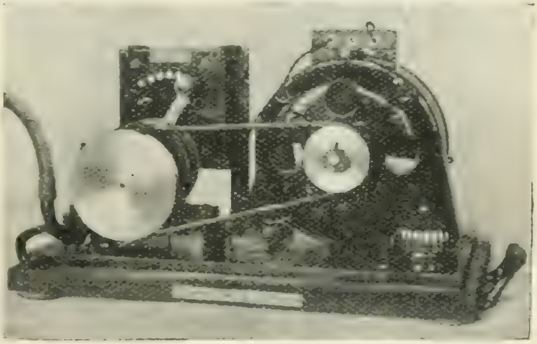

Rotary Blower with Electric Motor.

PRICES :—

Etherization Apparatus, complete in Mahogany Case ...	£17	18	6
Blower, complete with Motor, for use with alternating current	15	15	0
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Foot Bellows, for use where electric current is not available ...	2	2	0

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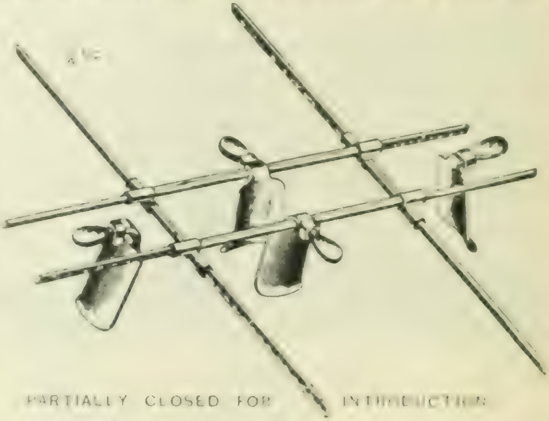

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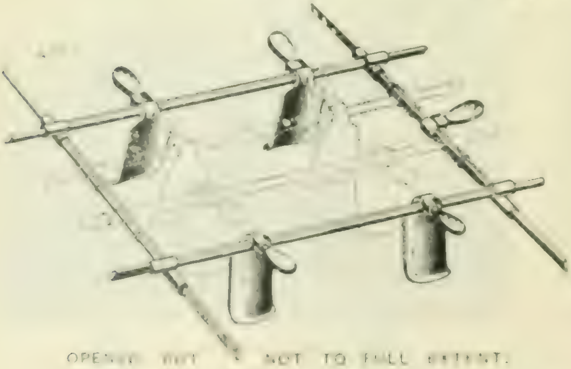

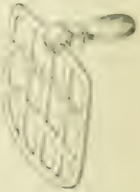

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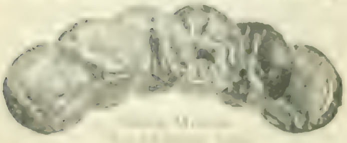

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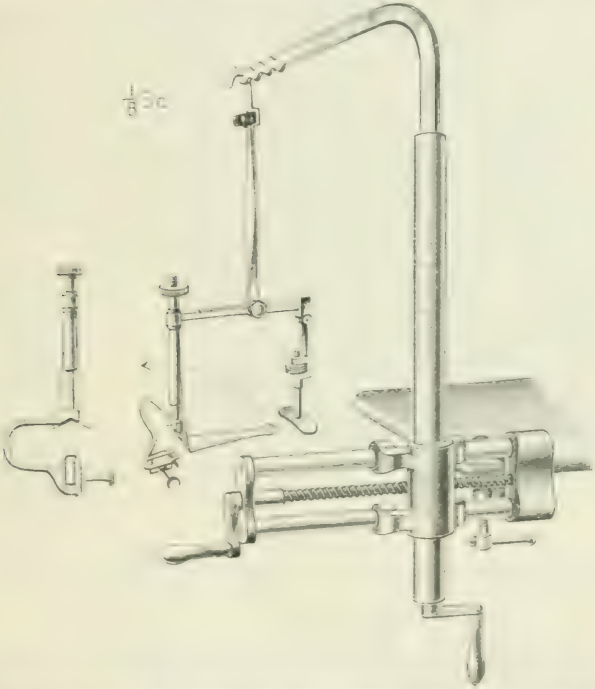

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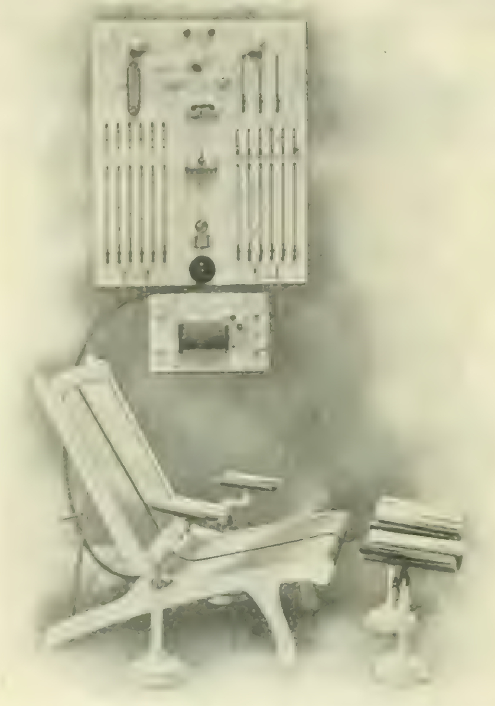

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Germs are all destroyed in less than half an hour. All that is necessary is to pour in requisite amount of water, place in dressings, adjust lid, and set on gas-ring, fire, or other heating apparatus.

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Prices of larger sizes on application.

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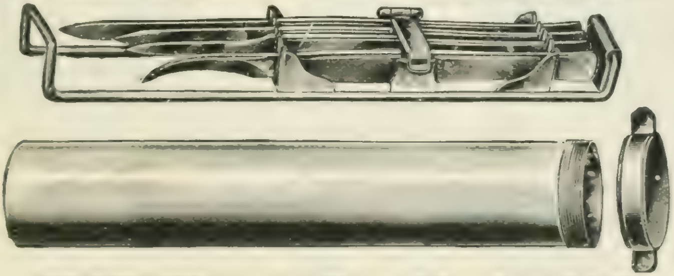

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Case and Carrier for 2 knives, 5/-; for 4 knives	each	7/6
Scalpels, forged solid, best English	„	1/6 & 2/6
Symes' or Paget's Knives	„	2/- & 2/9

Brytstele preserves the lustre of all steel instruments, and keeps the edges of blades sharp.

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HIGH PRESSURE ($\frac{10}{\text{LB.}}$) STERILIZER
FOR DRESSINGS, Etc.

WITH VACUUM ATTACHMENTS. Registered and Patent applied for.

Renders Dressings, etc., absolutely Sterile and dry in 30 minutes at the cost of a few pence.

EVERY STERILIZER IS CAREFULLY TESTED BEFORE PACKING

Automatic.
Simple to use.

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Reasonable in price.

Handsome in appearance.

Made of stout copper and gun metal, and supplied with safety valve, water gauge, taps, etc., stand with Bunsen burner, and one nickel plated improved model drum which will hold 2 overalls, 6 towels and sufficient dressings for any major operation.

Diameter outside	11 ins.
Height to lid with stand	23 ins.
Size of drum	10½ ins. high by 7½ ins. across.

Price of Sterilizer complete on stand with Bunsen Burner and one nickel plated drum to contain the dressings, etc. £6 10 0

Extra drums 20s. each

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No. 1—Size of cabinet 18 × 14 × 8 (2 plate glass shelves)	**£4**	**10**	**0**
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Without drawer, **10**/- less. With iron back instead of plate glass, **7/6** less.

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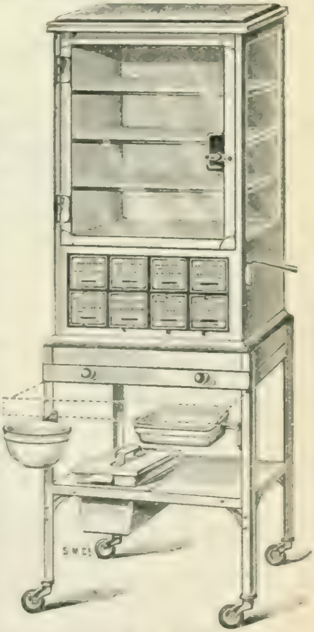

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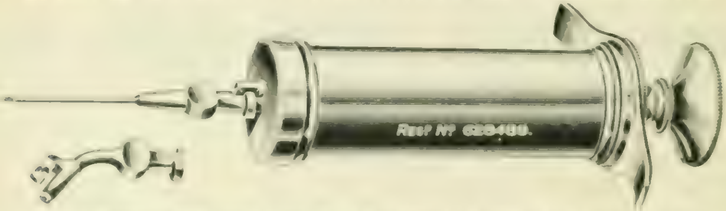

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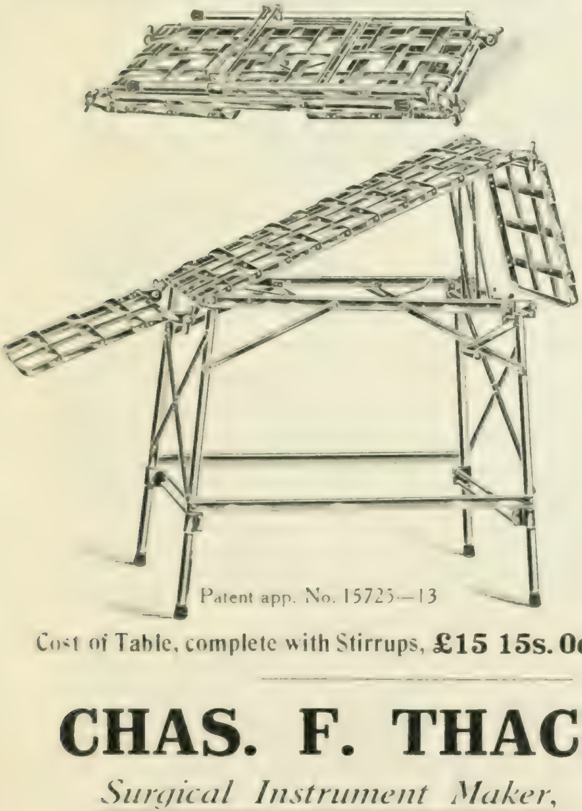

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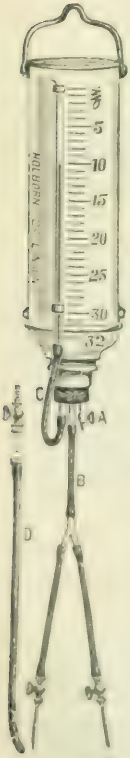

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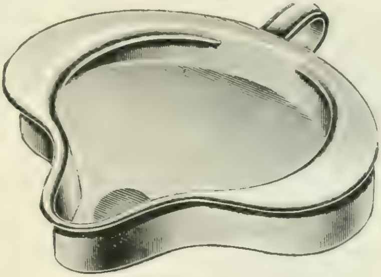

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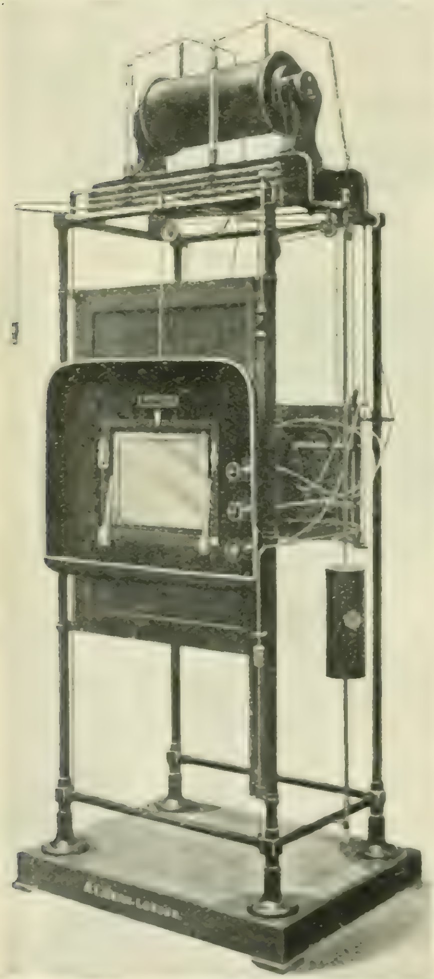

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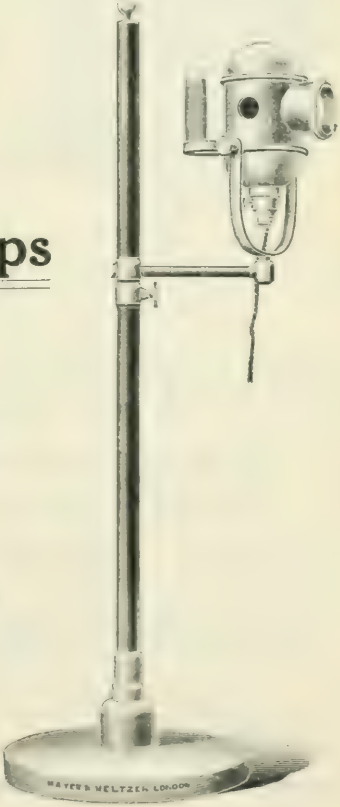

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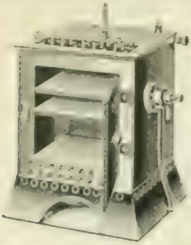

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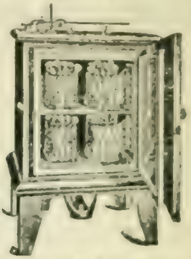

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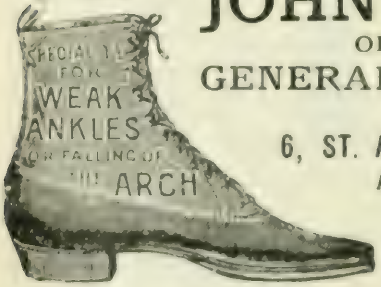

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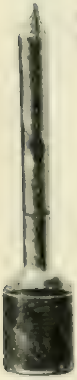

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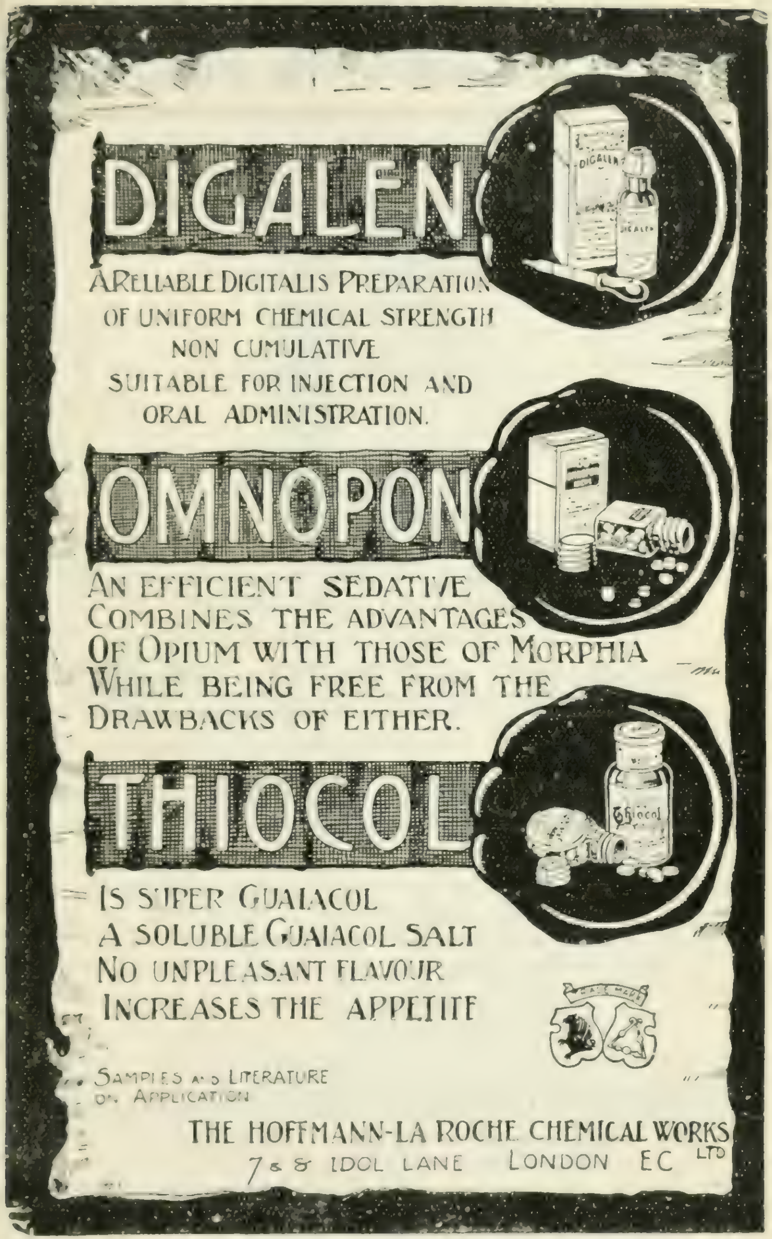
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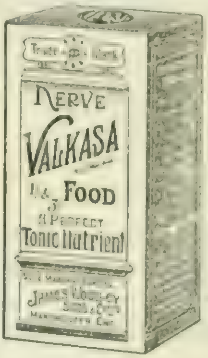

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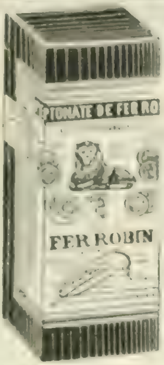

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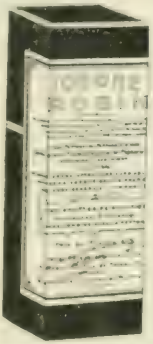

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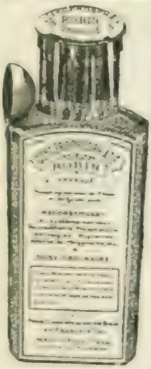

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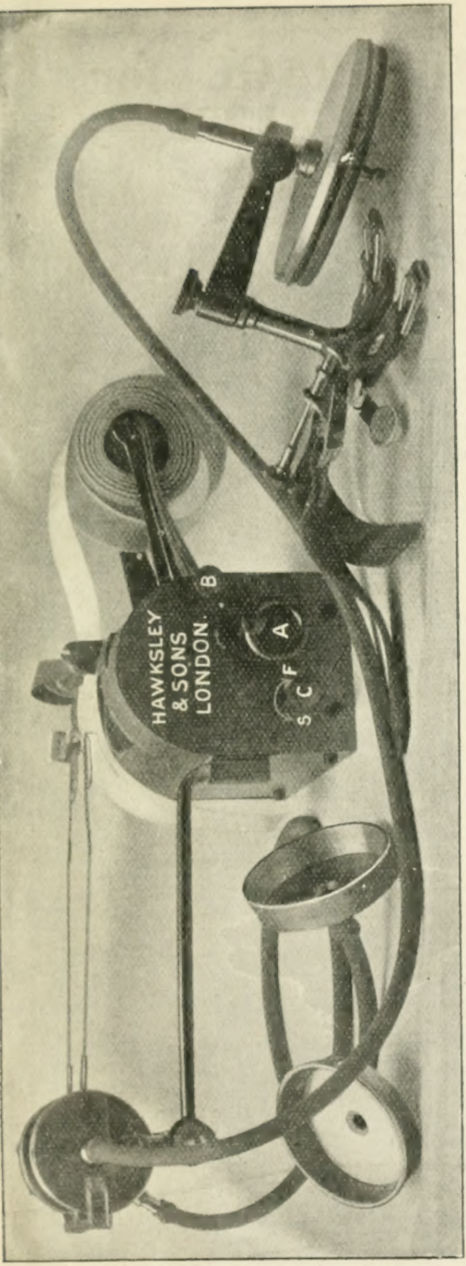

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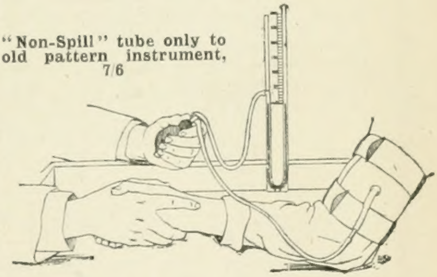

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2 oz. bots.	8d. each.	½ lb. bots.	2/2 each.
¼ lb. „	1/2 „	1 lb. „	4/- „

In bulk (C. quarts and upwards), 3/8 per lb.

Syr. Pectoralis Rub. (FERRIS)

A most elegant and efficacious Cough Linctus.

The active ingredients are Morphia, Chloroform, Hydrocyanic Acid, Hydrobromic Acid, and Glycerine, and the preparation is delicately coloured. *Dose: 1 to 2 drachms.*

PRICES:					
¼ lb. bots.	5d. each	½ lb. bots.	9d. each.	1 lb. bots.	1/4 each.

In bulk (C. quarts and upwards), 1/2 per lb.

FERRIS & COMPY. Ltd.,

Wholesale & Export Druggists & Manufacturing Chemists,

BRISTOL.

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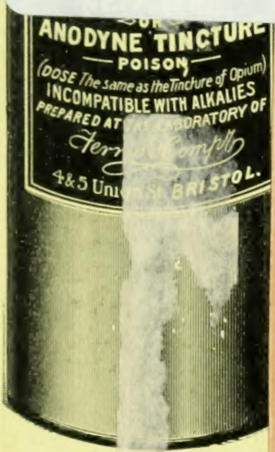
ANODYNE TINCTURE
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(DOSE The same as the Tincture of Opium)
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Sent out in the following
Nepenthe (ordinary), in 2 oz. and 16 oz. Bottles.
Glycerole of Nepenthe, f mic injection (8 times the sing in 1 oz. Bottles.
Double Strength Nepent 4 oz., 8 oz., and 16 oz. Bottles
Nepenthe Suppositories 3 doz. (in moulds of distinc four strengths, equivalent to ½ gr., and 1 gr. Morphia resp

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FERRIS & COMPY. Ltd.,
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Reports of Cases and fuller particulars at the disposal of Medical Men.